The RUBBER AGE

HNOLOGY DEPT.

★ ★ ★ ★ ★ ★ ★ ★ ★ June, 1943 ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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KEEP IT FLYING!
—Buy War Bonds

Newsletter No. 6
JUNE, 1943

Published by Rubber Chemicals Division of DU PONT

Thermoflex A and Neozone A Inhibit Flex-Cracking in Reclaimed Rubber Stocks

DUE to present conditions, most of the rubber stocks you are now mixing contain a large quantity of reclaimed rubber. Stocks of this type are being used in services where compositions rich in crude rubber were used previously. It is now more important than ever before to build the best possible quality into these stocks and make the best possible use of available compounding ingredients.

The useful life of articles made from stocks containing large amounts of reclaimed rubber is increased by the use of Thermoflex A or Neozone A because these antioxidants also inhibit failure caused by flex-cracking.

TEST DATA—The following data illustrates the degree of resistance to flex-cracking that is imparted by Thermoflex A and Neozone A to "F" grade camelback stock. The flex ratings are based on tests run on the du Pont Flexing Machine which is illustrated in Figure I. Figure II illustrates the type of failure which occurs on this machine. A flex rating of "0" is perfect, no cracks; and a flex rating of 10 indicates that the test sample has failed completely by cracking entirely through its thickness.

Compound 1231	633	634	635
Whole Tire Reclaim	182.0	182.0	182.0
THERMOFLEX A	—	1.0	—
NEOZONE A	—	—	1.0
2-MT	0.85	0.85	0.85
ACCELERATOR 808	0.2	0.2	0.2
Zinc Oxide	2.0	2.0	2.0
Channel Carbon Black	22.5	22.5	22.5
Stearic Acid	3.0	3.0	3.0
Carbonex S	5.5	5.5	5.5
Pine Tar	2.5	2.5	2.5
Sulfur	4.0	4.0	4.0
(Slab 0.100" thick) Press Cure: 60 minutes at 274°F.			
	——Flex Rating——		
After 24 hours flexing	9	1	2
After 48 hours flexing	9	5	8
After 72 hours flexing	9	9	9

Similar outstanding results are obtained with these antioxidants in many other products which must have long life under dynamic service conditions. Outstanding among these applications are belt, shoe sole, pneumatic tire and certain hose stocks.

AGING IMPROVED—These antioxidants also inhibit deterioration as determined by the oxygen bomb test, not only when judged by decrease in tensile strength but also when judged by decrease in tear resistance.

Neozone A is less expensive than Thermoflex A but, of the two products, Thermoflex A is superior in preventing flex-cracking and in resisting deterioration as measured by loss of tear resistance and is well worth the added cost.

2-MT-808 ACCELERATION—Crude rubber and reclaimed rubber tread and carcass stocks accelerated with a combination of 2-MT and Accelerator 808 process safely and their vulcanizates have high resilience and excellent resistance to aging and flex-cracking. At elevated temperatures 2-MT—808 accelerated stocks retain their tensile strength and resistance to tear to an extraordinary degree.

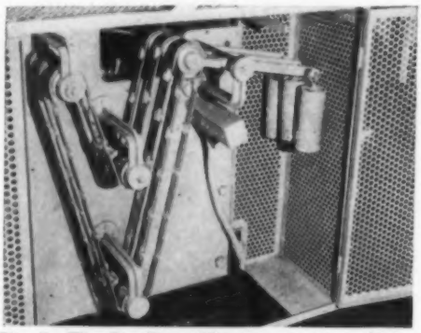


Fig. I. The Du Pont Flexing machine. Press cured samples fastened together to form an endless belt are flexed over pulleys under prescribed speed and load conditions. Samples are bent in one direction three times for each time in the reverse direction.

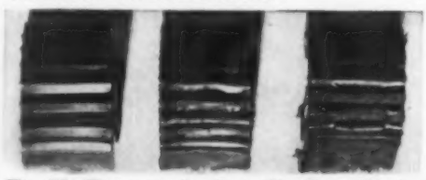


Fig. II. Test samples from Du Pont Flexing machine illustrate from left to right the following flex ratings: 0, 5, 10.

SODIUM ACETATE AS A RETARDER FOR NEOPRENE. During the warm weather months you will find sodium acetate to be of great value in the processing of neoprene compositions. Its use will counteract the tendency of these compositions to scorch during processing and to bin-cure during storage. Sodium acetate is effective with all types of neoprene and functions either in the presence or absence of accelerators. It has a pronounced effect in retarding the rate of vulcanization at temperatures under 240°F. for relatively long periods of time, while at temperatures above 240°F. the time period shortens rapidly as the temperature increases until, at normal curing temperatures, 274°F. and above, the retardation effect entirely disappears and an activating effect becomes apparent.

Sodium acetate is available in both flake and granular form. We recommend using Granular 60% Sodium Acetate because it melts at approximately 50°C. and hence disperses readily during the mixing of neoprene stocks.

A SATURATED SOLUTION OF ACCELERATOR 552 IN BENZENE when used as a wash on plies of neoprene stocks will enhance their adhesion in the vulcanized assembly. The Accelerator 552 acts as a chemical plasticizer of the neoprene surface under the influence of heat during the early stages of vulcanization. As a result, better knitting of the stock will be obtained which will give greater adhesion. This treatment is particularly advantageous for building rolls to eliminate lamination trouble.

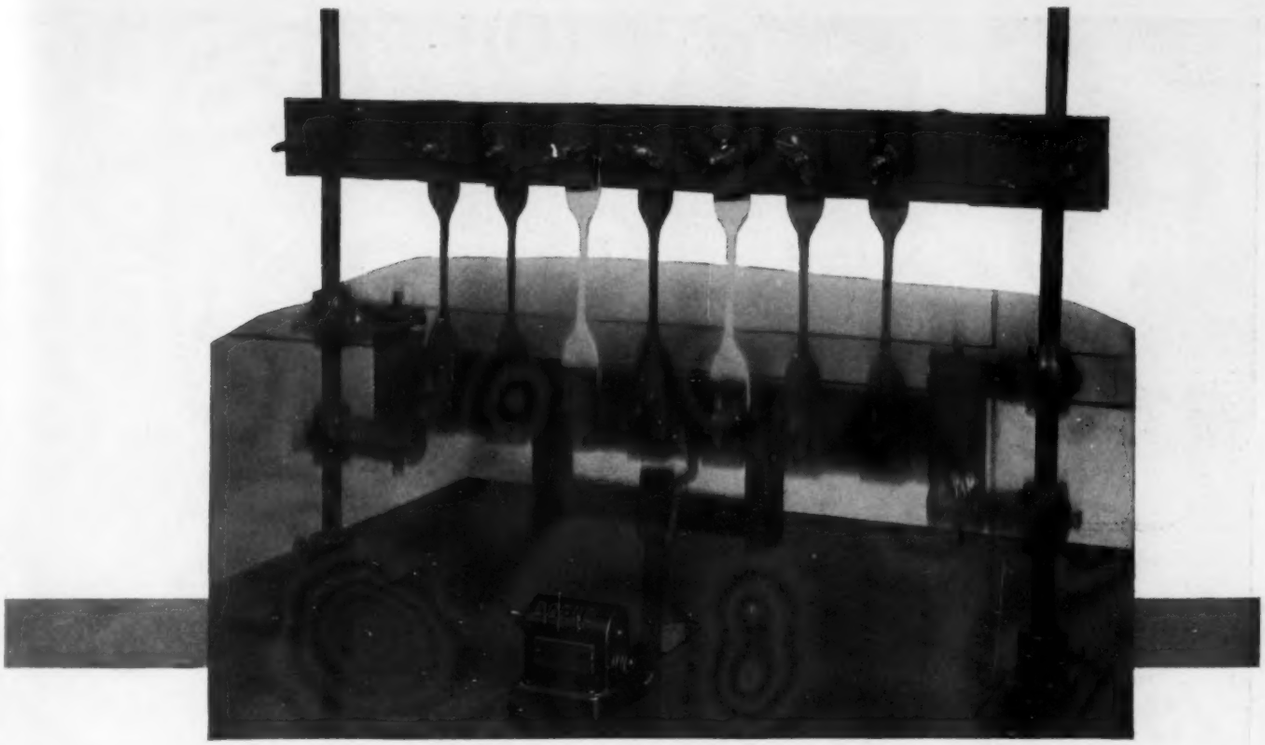
SERVICE—Are you having difficulty in formulating compounds to meet difficult specifications? The Du Pont Rubber Laboratory Staff will be pleased to assist you.

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. June, 1943. Vol. 53, No. 3.



It's a one-way stretch to longer life

ONE of the many functions of our Customer Service Laboratory is to establish the physical properties of the compounds we develop or evaluate for you. Flex-life is one of these important characteristics, since it is indicative of the useful life of the material.

From the results of this and numerous other tests in both laboratory and field, we are able to make sound recommendations for compounding and processing. You can have confidence in them for they are backed not merely by theory, but by actual test performance.

The entire purpose of the Hycar Customer Service Laboratory, its facilities and personnel, is to help solve your problems in synthetic rubber. We urge you to make full use of them.

HYCAR CHEMICAL COMPANY, *Akron, Ohio*

HYCAR *Synthetic* **Rubber**

LARGEST INDEPENDENT PRODUCER IN AMERICA OF BUTADIENE SYNTHETIC RUBBER

THE SIGN OF THE MOST COMPLETE LINE OF ZINC OXIDES

• The Sign of the most complete range of zinc oxide particle size characteristics — ranging from the colloidal dimensions of Kadox to the relatively coarse Horse Head XX Red-78.

• The Sign of the manufacturer of both "fast" curing and "slow" curing zinc oxides.

• The Sign of zinc oxides made under three different processes—American Process, French Process, Palmerton Process — in order to impart special properties to meet a variety of special rubber requirements.

• The Sign of the manufacturer of special zinc oxides for improved processing.

• The Sign of the largest and best equipped research organization devoted to the study of zinc products.

THE NEW JERSEY ZINC COMPANY

Manufacturers of the Famous Horse Head Zinc Products

A Good Pair . . .

BUNA S and NAFTOLEN

REG. U. S. PAT. OFFICE

If you are having difficulty in the production of rubber goods from GR-S, we suggest that you try Naftolen in your compounds. Like GR-S, Naftolen is an unsaturated hydrocarbon, compatible in all proportions with Buna S. The use of large proportions of Naftolen (up to 100 parts on 100 parts of Buna S) will result in a soft, easy-processing stock that can be extruded or calendered without difficulty. By proper adjustment of sulfur content, Naftolen-containing Buna S compounds can be vulcanized to either soft or hard rubber.

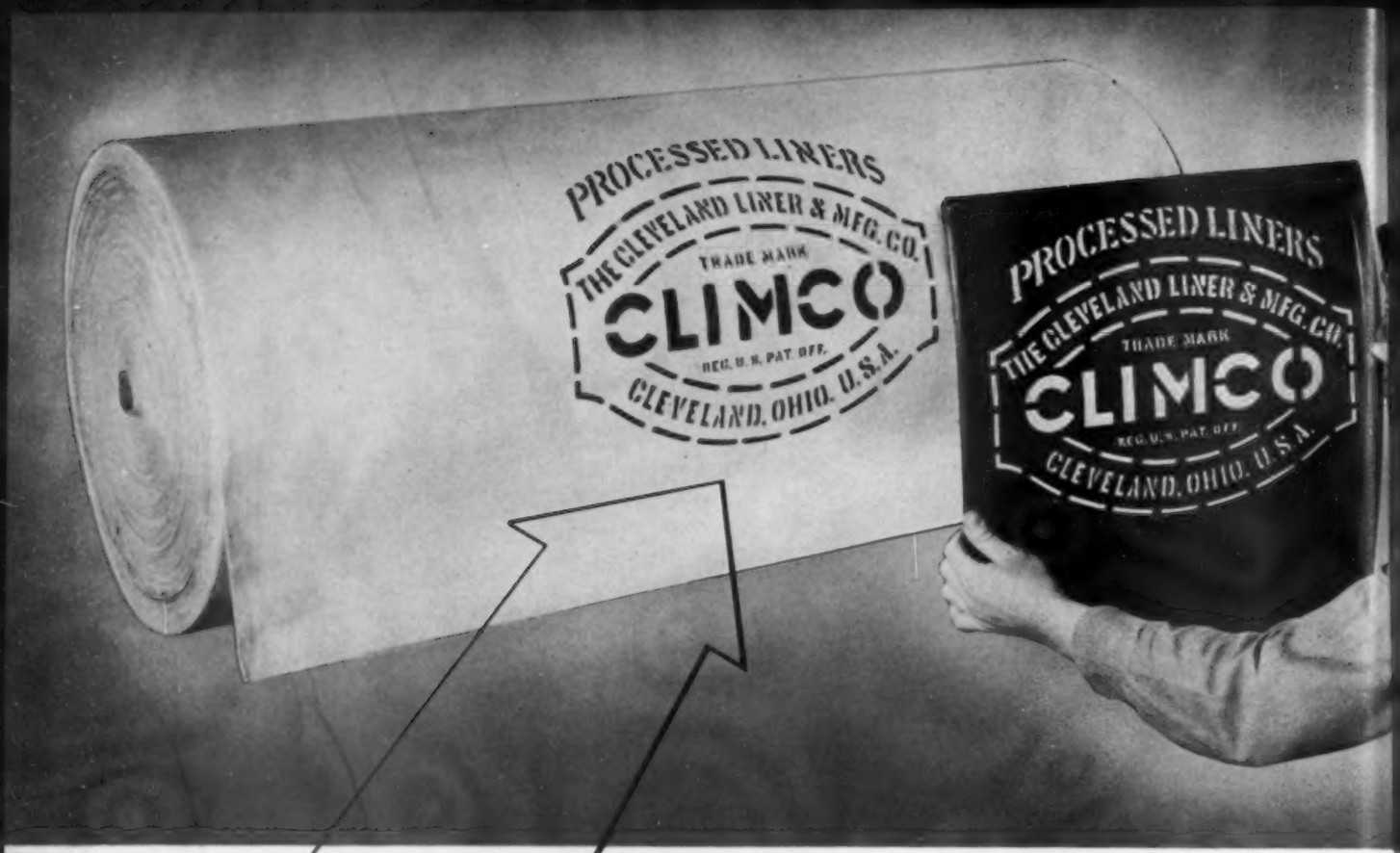
WILMINGTON CHEMICAL CORPORATION

10 East 40th St. — **New York, N. Y.**

Plant and Laboratory: — *Wilmington, Delaware*

W C=C

REG. U. S. PAT. OFFICE



THIS TRADEMARK IS *your guarantee of Quality*

When a liner is stenciled with the Climco trademark, it means the liner has had the *best processing available.*

During its many years of pioneering and leadership in liner processing, Cleveland Liner has always considered quality to be paramount over all other considerations. Consequently, Climco Processing enjoys unrivaled popularity throughout the industry. Most leading firms have standardized on Climco, because they have found it insures better separation and prevents stock adhesions. They also know it pays for itself in the long run by savings in time and money, as well as greatly lengthening the life of the liner.

Now is no time to experiment. Today's production conditions demand that you have the best processing available. Make Climco *your* standard of quality, *too.*

CLIMCO
CLEVELAND, OHIO, U.S.A.

LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

THE CLEVELAND LINER & MFG. CO.

CLEVELAND, OHIO

CLIMCO PROCESSED LINERS

FOR FASTER, BETTER PRODUCTION AT LOWER COST

GR-S *and* KALVAN

TWO REASONS FOR USING SOME KALVAN IN GR-S COMPOUNDING–

First

KALVAN improves tear resistance and assists in removing cured articles from hot molds.

Second

Substitution of **KALVAN** for one-third or one-half of the black ordinarily used gives improved building tack.

●

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

PERBUNAN

WHEN IT'S COLD...

PERBUNAN

Even at extremely low temperatures, this oil-resistant synthetic rubber stays flexible and holds a firm seal. A good reason why Perbunan has replaced metal in gasoline and hydraulic oil "plumbing" installations in United States aircraft being built today.

Write STANCO DISTRIBUTORS, INC., 26 Broadway, New York City

WAREHOUSE STOCKS IN NEW JERSEY, LOUISIANA AND CALIFORNIA

A FREE FLOWING PLASTICIZER
FOR STYRENE TYPE SYNTHETICS

SYN-TAC **IMPROVES** { **TACK** **DISPERSION** **ELONGATION** **TEAR**

The C. P. Hall Co. CHEMICAL MANUFACTURERS

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL.

WHEN there's a fight going on, it takes good guns and *good gunners* to win. Near hits score no knockouts!

When you've *got to have* solvents—*almost* getting them to you when you want them adds up to no help.

That's why it will pay you to make firsthand acquaintance with SKELLYSOLVE and Solvents Division of Skelly Oil Company. We have the sources of supply . . . the refining facilities . . . the distribution organization. The Skellysolve reputation for delivering the goods has been built on performance in the pinches. Phone, write, or wire us and you'll *get* the solvents you need when you need them.

SKELLYSOLVE
in the
RUBBER INDUSTRY

There are six different types of Skellysolve which are especially adapted to various uses in the rubber industry, for making rubber cements, and for many different rubber fabricating operations. Skellysolve offers many advantages over benzol, rubber solvent gasoline, toluol, carbon tetrachloride, etc. It will pay you to investigate Skellysolve. Write today.

SKELLY

SKELLYSOLVE

SOLVENTS DIVISION, SKELLY OIL CO.
SKELLY BLDG., KANSAS CITY, MO.

. . . when it comes, *the answer* to this question *is ready!*

Getting the utmost production from your allotted Synthetic—and getting it with assurance of improved quality is the question that was answered months ahead of the need . . . The answer has been proved repeatedly in the laboratory and by product testing. EXTENDER 600 is that answer and we are ready with ample stock and production facilities—with enough basic raw materials—to meet the Industry's needs.

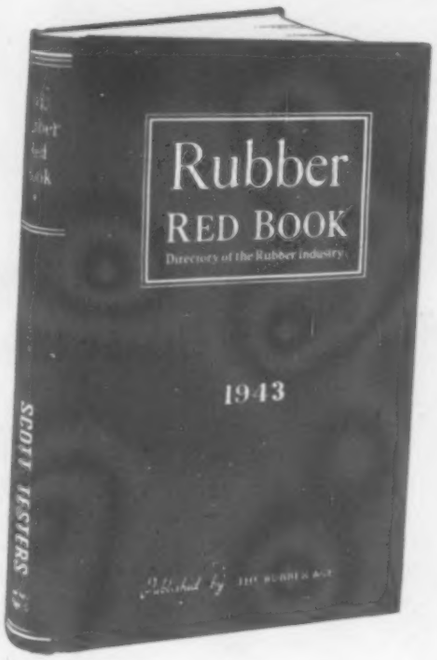
In this outstanding vegetable oil copolymer is the extending ability to make your Synthetic go as much as 50% farther . . . In its results may be counted increased tensile, improved tack, greater resistance to flex-cracking and a smoothness that greatly improves extrusion. In cost, availability and results EXTENDER 600 provides advantages. Write or wire us for working sample and data.

EXTENDER 600

STANDARD
Chemical Company

AKRON SAVINGS AND LOAN BLDG. AKRON, OHIO

Last Call for Copy
for 1943 Rubber Red Book



ALL QUESTIONNAIRES sent to suppliers, rubber manufacturers and others for listing their products, personnel and services in the 1943 Rubber Red Book must be filled in and returned to us promptly *but not later than June 30.* Work cannot be started in compiling data for this edition until all questionnaires have been returned to us.

ADVERTISERS are also requested to send copy for their advertisements by June 30. Any suppliers who still desire to order advertising space may do so by sending in their order today and forwarding copy before the end of the month.

Already over 200 suppliers have ordered the greatest volume of advertising space in the history of the Rubber Red Book. This Directory offers a complete coverage of the rubber industry at a cost of but a few cents a day. Arrange *now* to be represented with adequate space!

RUBBER RED BOOK

Directory of the Rubber Industry

250 West 57th Street **New York 19, N. Y.**

The Case of the Corroded Propeller Shaft

ASK an engineer on our new wooden ships where he most hates corrosion, and he'll whip back the two words, "propeller shaft." He knows lost time in drydock and expensive reconditioning swiftly follow the formation of rust on that giant driving rod.

Yet, until recently, the engineer of the wooden ship was resigned to propeller shaft corrosion. The reason: the shaft on such ships bears an extraordinarily heavy current of electricity. Against this severe and ceaseless electrical attack, protective coatings of even the highest quality soon broke down.

A coating company working with Thiokol* synthetic rubber had an idea. Could we, they asked, supply a brine-proof material having extremely high insulating properties—a powdery material which would fuse on metal and form a hard, resilient continuous film? It turned out we could. As applied by the coating company (name on request), that Thiokol material solved the case of the corroding propeller shaft, and is today helping to keep precious ships *out* of drydock and *on* their Victory jobs.

Thiokol Corporation, Trenton, N. J.

*Thiokol Corporation, Trademark Reg. U. S. Pat. Off.

Thiokol*

SYNTHETIC RUBBER

"America's First"

OTHER THIOKOL CORPORATION PRODUCTS: "THIOKOL" MOLDING POWDERS..."THIOKOL" WATER DISPERSIONS FOR COATING MATERIALS... VULCANIZING AGENTS... CHEMICALS AND PLASTICIZERS FOR SYNTHETIC RUBBERS

Capitol Liner Treatment

Now In Its New Home—

OUR plant is now located at the new address given below. We have made many improvements to increase our production and service for the armed services and the merchant marine. You will share in these benefits in our processing of your cotton liners.

May we again emphasize that a great many concerns have found that *Capitol* treated liners last considerably longer than those untreated, thus enabling them to materially reduce their purchases of cotton piece goods.

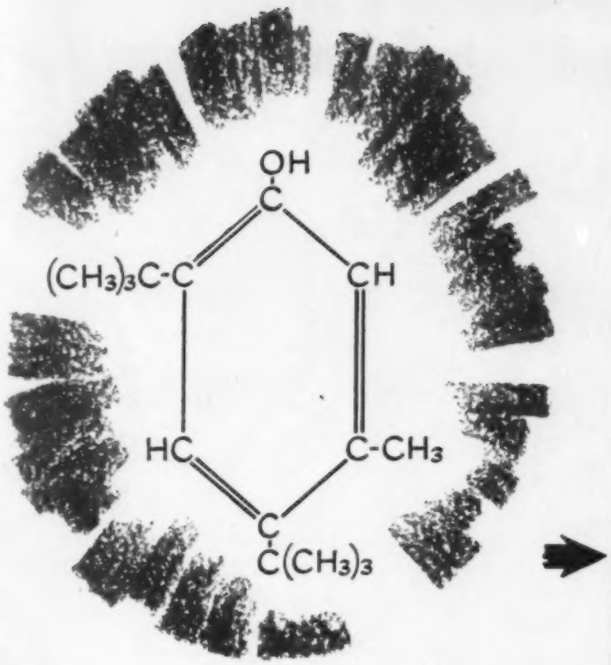
So you may discover this for yourself, please accept our offer to treat a liner gratis. Send us 50 or 100 yards and we will process and return it so you can test in your own plant. No obligation of course.

TEXTILE PROOFERS, INC.

181-193 Culver Ave., Jersey City, N. J.

Originators of the Capitol Process Liner Treatment

KOPPERS D. B. M.



4, 6-Di-tertiary-BUTYL-m-CRESOL

Properties: *(Pure Compound)*

Molecular Weight	220
Melting Point	62.5°C.
Boiling Point:	
At 100 mm. (approximate)	171°C.
Atmospheric (approximate)	285°C.
Specific Gravity at 50/50°F	0.920

State: Light-colored semi-solid, crystalline, mild odor.

Solubility: Practically insoluble in water. Easily soluble in alcohol, benzene, gasoline and carbon tetrachloride. Insoluble in caustic alkali solutions.

Uses: In compounding certain types of synthetic rubber, as a softener and plasticizing agent, and to improve tack. In the manufacture of resins, particularly because of its oil-solubility. It has been suggested for use as an anti-skinning agent for paints and varnishes.

Koppers will be glad to submit samples and prices on this and other coal derivatives, including tar bases, naphthalene, industrial pitches and creosote.

Koppers also supplies to the chemical industry: Coal for steam and for processing. Coke for metallurgical use and for heating. Coal processing systems. Gas plants. Gas purification systems. Gas holders. Valves. Time cycle controls. Anti-corrosive alloys. Fast's self-aligning couplings. Piston rings for compressors, pumps, and steam and diesel engines. Pressure-treated timber for damp and humid locations. Coal tar roofing, waterproofing, dampproofing, industrial pitches.—Koppers Company and Affiliates, Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

Agripol

can "take it" when natural rubber can't

When RCI chemists set out to find a quick answer to America's urgent need for rubber, they had two objectives in mind. They wanted, of course, to reproduce the desirable characteristics of natural rubber. But they also sought something *better*—something less susceptible to the hazards run by rubber in industrial applications.

They found the answer in Agripol—a synthetic closely duplicating the *good* attributes of natural rubber—and far superior in resistance to heat, cold, oxidation, oil and acids!

And that's only half the story. Agripol can not only "take it" when natural rubber can't; Agripol has these added advantages: It is the first *chemurgic* rubber, made from materials now grown in vast quantities on American farms. It can be fabricated with present equipment of rubber goods manufacturers. And it is available *right now* in volume sufficient to relieve substantially America's rubber problem.

Other unique and valuable chemical products have come from RCI. Many more are in prospect. But—because of its quality, its timeliness, and its potential as a factor in uniting agriculture and industry—RCI is particularly proud of Agripol.

REICHHOLD CHEMICALS, INCORPORATED

General Offices and Main Plant, Detroit, Mich. Other Plants: Brooklyn, N. Y.; Elizabeth, N. J.; South San Francisco, Calif.; Tuscaloosa, Ala.; Liverpool, England; Sydney, Australia.

CHEMURGIC RUBBER • INDUSTRIAL PLASTICS
INDUSTRIAL CHEMICALS
CHEMICAL COLORS • SYNTHETIC RESINS

RCI

Check List OF MONSANTO CHEMICALS
FOR THE RUBBER INDUSTRY

ANTIOXIDANTS

FLECTOL H (Condensation product of acetone and aniline)

SANTOFLEX B (Reaction product of acetone and para-aminodiphenyl)

SANTOFLEX BX (Constant composition blend of Santoflex B and diphenylparaphenylene diamine)

THIAZOLE ACCELERATORS

SANTOCURE (Condensation product of mercapto-benzothiazole with cyclohexylamine)

EL-SIXTY (Dibenzothiazyldimethylthiol urea)

UREKA C (Benzothiazylthiobenzoate)

UREKA (Constant composition blend of diphenyl-guanidine and 2, 4-dinitrophenyl thiobenzo-thiazole)

UREKA BLEND B (Blend similar to Ureka with portion of DPG replaced by Guantal)

THIOTAX (2-Mercapto benzo thiazole)

THIOFIDE (2, 2' dithio-bis benzothiazole)

ALDEHYDE AMINE ACCELERATORS

A-10 (Condensation product of aniline and form-aldehyde)

A-19 (Formaldehyde derivative of a condensation product of aniline and acetaldehyde

A-32 (Reaction product of butyraldehyde and butylidene aniline)

A-77 (Condensation product of acetaldehyde and aniline)

A-100 (Aldehyde derivative of a Schiff's base made with use of both butyraldehyde and acetaldehyde)

GUANIDINE ACCELERATORS

DPG (Diphenylguanidine)

GUANTAL (Reaction product of diphenylguanidine and phthalic acid)

ULTRA ACCELERATORS FOR LATEX, etc.

R-2 CRYSTALS (Reaction product of carbon bi-sulfide with methylene dipiperidine)

PIP PIP (Piperidine-pentamethylene dithiocarbamate)

THIURAD (Tetramethyl thiuram disulfide)

METHASAN (Zinc salt of dimethyl dithiocarbamic acid)

ETHASAN (Zinc salt of diethyl dithiocarbamic acid)

BUTASAN (Zinc salt of dibutyl dithiocarbamic acid)

MISCELLANEOUS MATERIALS

A-1 (Thiocarbanilidine)

OXYNONE (2, 4-Diamino Diphenylamine)

MOLD PASTE

ALSO COLORS AND DEODORANTS

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

For prices, samples, further information or technical assistance, inquire: MONSANTO CHEMICAL COMPANY, Rubber Service Department, Akron, Ohio.

GASTEX & PELLETEX

for VICTORY ON LAND — AT SEA IN THE AIR

Hose, wire, tires, motor mountings, footwear, and literally thousands of mechanical parts, some obscure but all important, are giving superior service in Army, Navy, and Air Force, because GASTEX and PELLETEX Semi-Reenforcing Blacks are used in the compounds.

For superior aging, easy processing, lower heat build up, greater resilience and greater resistance to solvents GASTEX and PELLETEX excel in both rubber and synthetic compounds.

On Government allocation today; at your service for civilian use after Hitler's funeral.

Consult our Technical Staff in your post-war planning.

HERRON BROS. & MEYER

OHIO BLDG., AKRON, OHIO.

GASTEX TRADE MARK

GENERAL SALES AGENTS FOR

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

PAMPA, TEXAS — GUYMON, OKLA.

PELLETEX TRADE MARK

DISTRICT SALES AGENTS

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HERRON & MEYER, Chicago
H. M. ROYAL, INC., Trenton, N. J.
ST. LAWRENCE CHEMICAL CO., LTD., Toronto - Montreal

RUBBER RESERVE PERMITS

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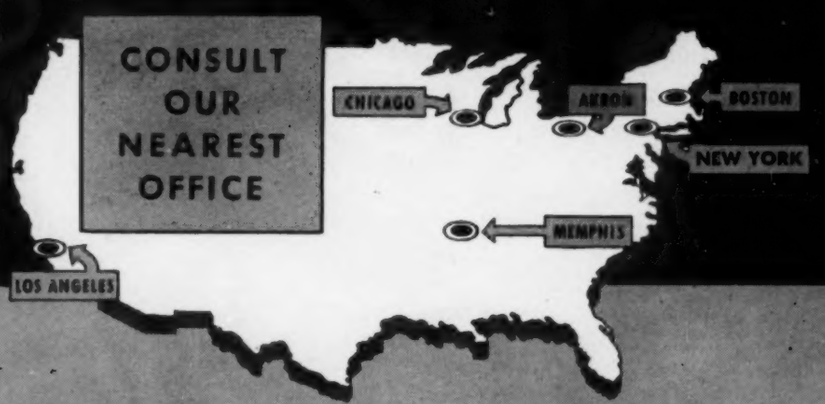
CRUDE RUBBER
BALATA
SYNTHETIC RUBBERS

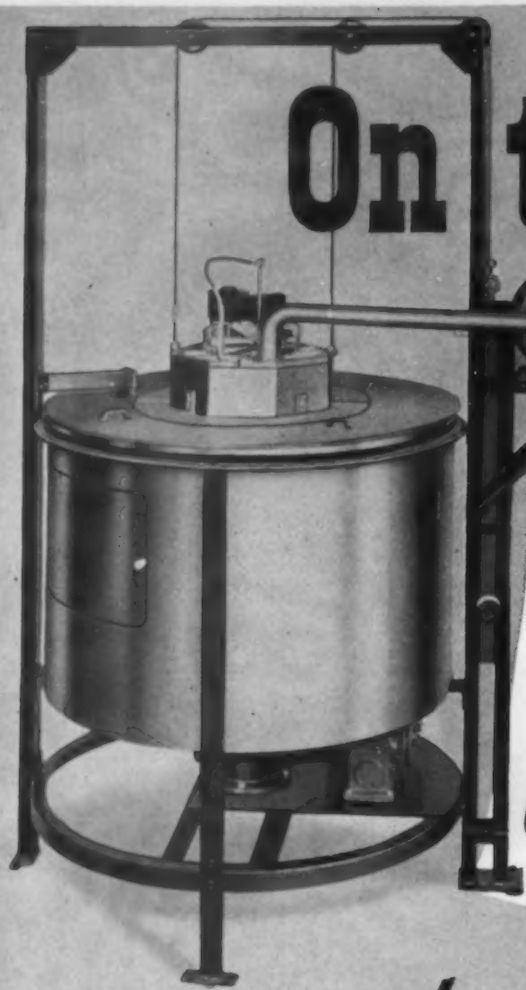
THE same experienced organization is being maintained to service your permits properly



H. MUEHLSTEIN & Co. INC.

122 EAST 42nd STREET, NEW YORK, N. Y.

CHICAGO: 327 So. La Salle St. • AKRON: 250 Jewett St. • LOS ANGELES: 318 W. 9th St. • MEMPHIS: 46 W. Virginia Ave. • BOSTON: 31 St. James Ave.



On the Job

168 Hours a Week!

National TRADE-MARK MODEL X-1-A ACCELERATED WEATHERING UNITS are now operating continuously 24 hours a day, 7 days a week, in many laboratories and plants throughout the country

Performance records are being established with these dependable units. They are meeting the increased demand for reliable and rapid weathering tests on materials designed to protect the personnel and equipment of our armed forces against the extreme weather conditions encountered in global warfare.

Manufacturers using the "National" Model X-1-A Accelerated Weathering Units are able to meet the exacting specifications required for plastics, rubber and rubber-like materials, protective and camouflage primers and finishes, weather resistant fabrics and other similar products which are to be exposed to the sun and weather.

A SOUND INVESTMENT FOR THE PRESENT AND FUTURE

The value and usefulness of the "National" Model X-1-A Accelerated Weathering Unit will not terminate with the war. The need for this equipment will be as great as ever in the development and production of the many materials needed for the post-war world.

This equipment is procurable on priority rating in accordance with regulations in effect at time order is placed.

NATIONAL CARBON COMPANY, INC. CARBON SALES DIVISION, CLEVELAND, OHIO
Unit of Union Carbide and Carbon Corporation GENERAL OFFICES: 30 EAST 42ND ST., NEW YORK, N. Y.
BRANCH SALES OFFICES: NEW YORK • PITTSBURGH • CHICAGO • ST. LOUIS • SAN FRANCISCO

LEADING TIRE MANUFACTURERS' TESTS PROVE
LOWER HEAT GENERATING QUALITIES OF

Continental "AA"

THE EASIER PROCESSING BLACK*
Right for your Buna S compounds, too!

ONE OF THESE GRADES IS YOUR BLACK: Continental "AAA" low heat generating, extremely easy processing . Continental "AA" low heat generating, easy processing Continental A medium cure, medium processing . Continental D standard.
FOR HIGH CONDUCTIVITY—Continental R-20, R-30, R-40, and a complete line of color blacks.

CONTINENTAL CARBON COMPANY

295 Madison Avenue, New York, N. Y. . SALES OFFICE: 311 Peoples Bank Bldg., Akron, Ohio
Sales Representatives: Ernest Jacoby & Co., Boston, Mass. . Marshall Dill, Los Angeles and San Francisco, Calif.
*SEND FOR SAMPLES

BUCA

A New Pigment for Compounding All Types of Synthetic Rubber!

GR-S	100.
Sulfur	2.5
Cumar MH 2½	5.
Zinc Oxide	5.
Stearic Acid	1.
Captax	2.
BUCA	100.

Cure 40 lb. Steam (287° F)

	TENSILE	ELONGATION	MOD. @ 300%
15 Minutes	1208	825%	370
30 "	1649	725	419
45 "	1858	687	472
60 "	1836	675	474
75 "	1813	675	493

MIXED AS FOLLOWS: Masterbatch was made up with some GR-S, Sulfur and Cumar MH 2½ mixing at 200° F. Allow this to rest for 24 hours and mixed with the rest of the GR-S. Pigments and accelerator were added in the usual manner.

MOORE & MUNGER

33 RECTOR STREET

NEW YORK

ALL OUT TO WIN THE WAR

Theirs is the "front line" fight — Ours is the duty — and privilege—to maintain the quality of our Blacks . . . essential ingredients in so many of the finished products they need.

KOSMOBILE 77 · DIXIEDENSED 77

DIXIEDENSED · KOSMOBILE

KOSMOS 20 · DIXIE 20

UNITED CARBON COMPANY, Inc.

Charleston, West Virginia

New York · Akron · Chicago

For EXTENDING · TACKIFYING · CEMENTING ·

HERE ARE **10** PRACTICAL REASONS FOR USING

PICCOLYTE

THE VERSATILE SYNTHETIC RESIN

1. Similar carbon-hydrogen ratio to rubber
2. Imparts very desirable "tack" to natural rubber, and to certain synthetic rubbers including polybutene and butadiene-styrene types
3. Highly desirable ingredient for rubber cements prepared in solvent form, or in emulsion form for latex types
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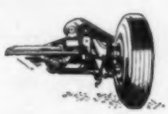
LOW PERMANENT  ***AND COMPRESSION SET***

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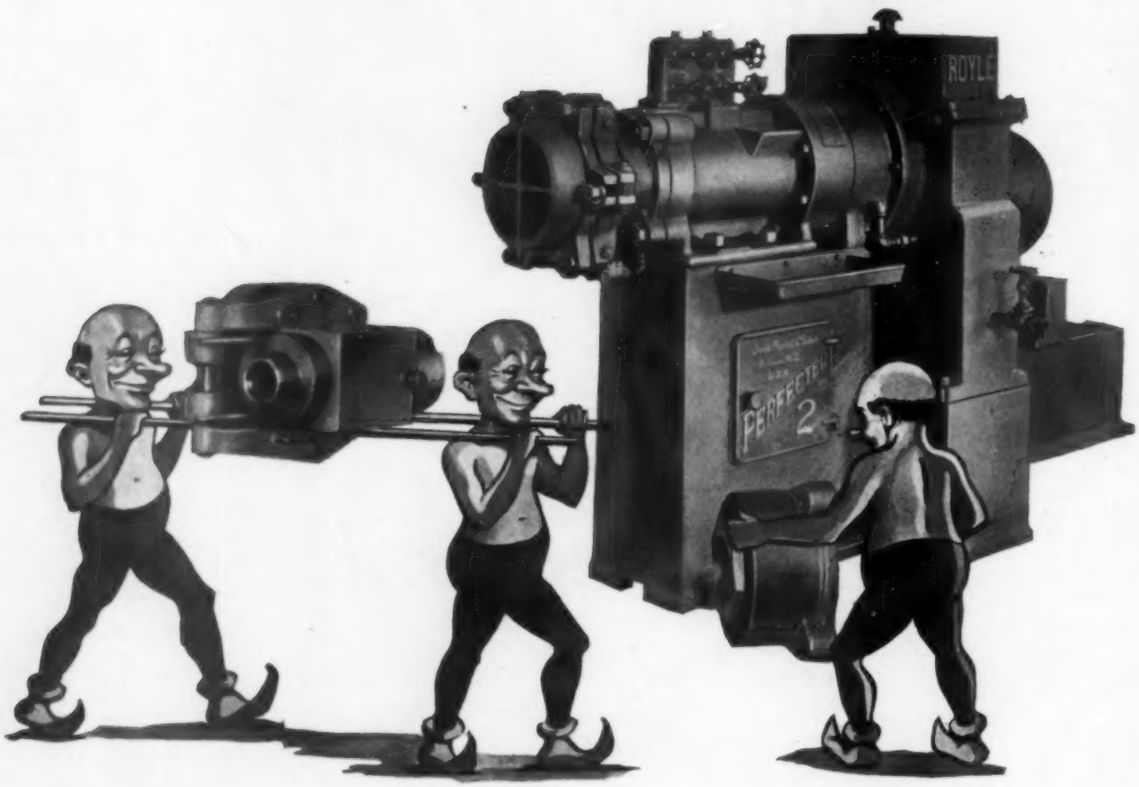

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VOLUME 54
NUMBER 3

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Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing office, East Stroudsburg, Pa.

Editorial and Advertising Offices, 250 West 57th St., New York 19, N. Y.

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R. I.
Western Representative—IRVING V. KOCH, 64 East Lake St., Chicago, Ill.

Entered as Second Class Matter, October 20, 1933 at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.

Contents Copyrighted 1943 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

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The **RUBBER AGE**

VOL. 53, No. 3 **JUNE, 1943**

Synthetic Rubber at Institute

THE Government-owned synthetic rubber plant at Institute, West Virginia, about 10 miles from Charleston, is the largest of such plants which have started operations to date. It is composed of three parts: one plant of four units to produce butadiene from alcohol; one of two units to produce styrene from benzene; and the third unit to copolymerize these materials into GR-S (Buna S). The butadiene and styrene units were designed and built and are being operated by the Carbide and Carbon Chemicals Corp., with Paul L. Alspaugh as superintendent. The copolymer plant, built by the U. S. Rubber Co. from plans developed by a committee of engineers, is being operated by that company, with George A. Graham as superintendent.

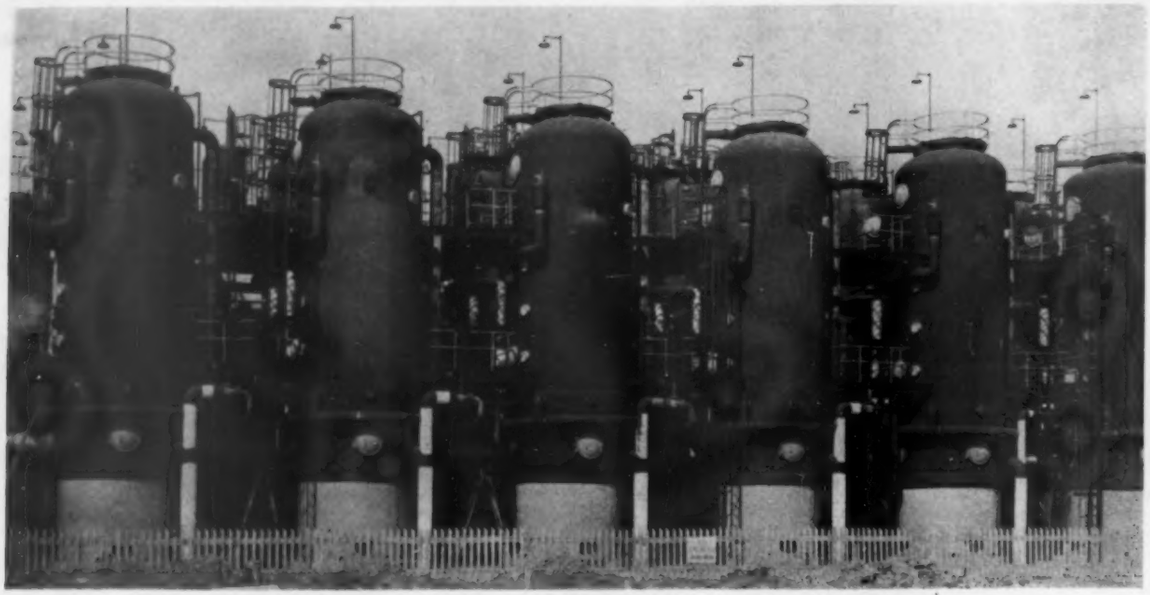
The estimated capacity of the Institute plant is 90,000 long tons of GR-S per year. It will be operated by a staff of approximately 1,250, and requires 120,000 gallons of water a minute, 14,400 kilowatts of electricity, 7,700 tons of coal a week, and 6,595 linear feet of waste disposal piping. When fully completed, it will represent an overall cost of $56,000,000. Its estimated production of 90,000 tons of GR-S per year may be compared to a plantation of 270,000 acres containing 24,000,000 trees.

The four butadiene units at Institute have a rated capacity of 20,000 short tons each. Alcohol, brought by railway tank cars and barges, is passed through a series of converters, the unreacted alcohol and intermediate products being removed for recycling through the converters in a recovering system consisting of distillation towers and scrubbers. The butadiene is then purified by distilling and washing until it is over the 98.5% purity specified by the Rubber Reserve Co.

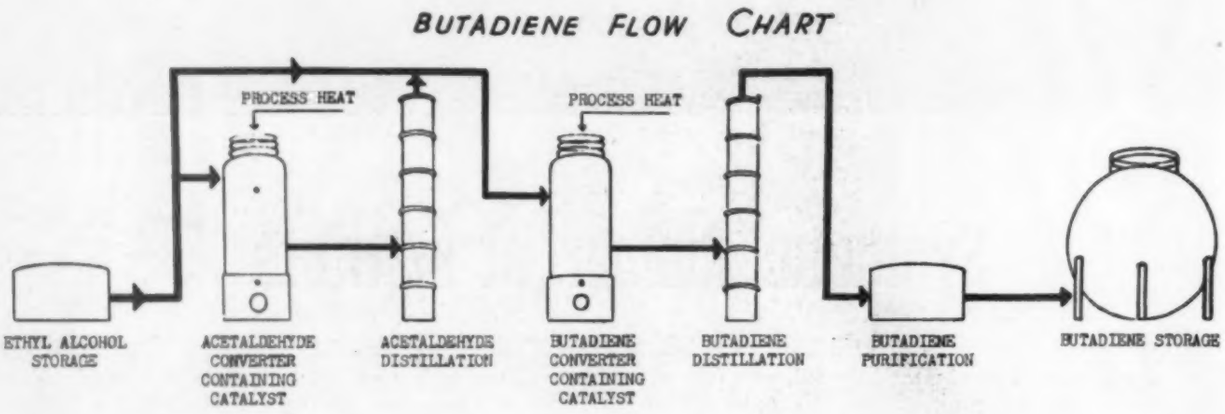
In the styrene process, benzol and ethylene are passed over a catalyst in an alkylator, the resulting ethylbenzene being removed from unreacted benzol in a series of fractionating columns and held in intermediate storage tanks, later being fed to a second set of reactors in which the styrene is formed. It is then purified by distillation. Both the butadiene and styrene are pumped direct by pipe line to the copolymer plant.

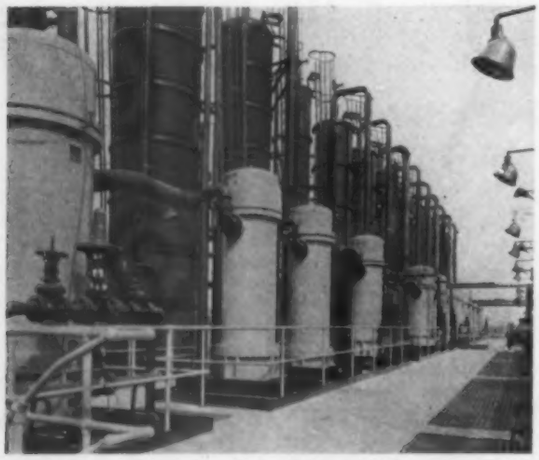
The copolymer plant is composed of three identical units, each with a capacity of 30,000 long tons per year. Butadiene and styrene, in the ratio of 3:1, are mixed with seven parts of soapy water in glass-lined reactor vessels. Unreacted butadiene and styrene are boiled off and recovered for reuse. The emulsion is then pumped to large blending tanks where it is mixed with other batches for uniformity. Coagulation is accomplished by the addition of salt and acid, and the coagulated particles are screened, washed, dried, and baled. The complete story is shown pictorially on the following pages.

Synthetic Rubber at Institute

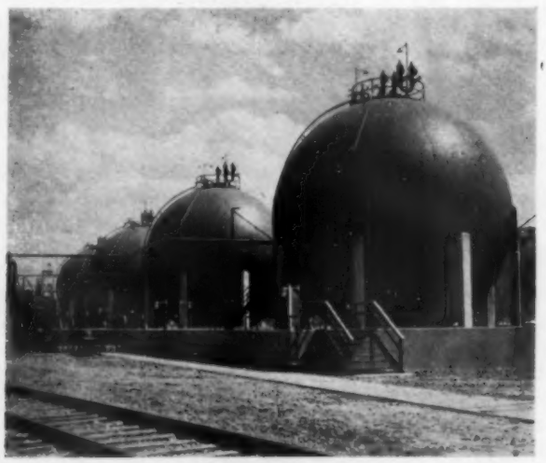


In the production of butadiene at Carbide's Institute plant the alcohol is first reacted in the above converters. The converters, of which there are two sets, are charged with catalysts. Grain alcohol is used.



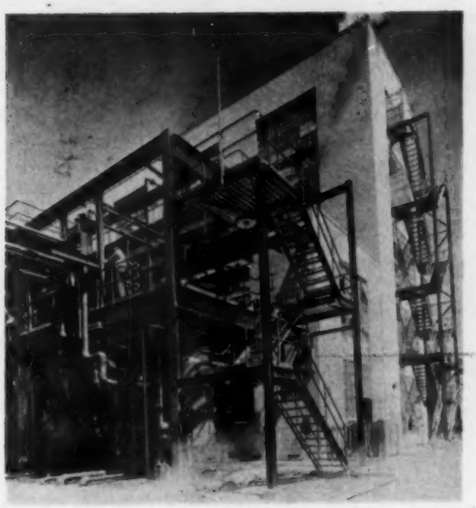


Here are the distillation towers where the butadiene is purified until it is over the 98.5% minimum specified by the Rubber Reserve Co.

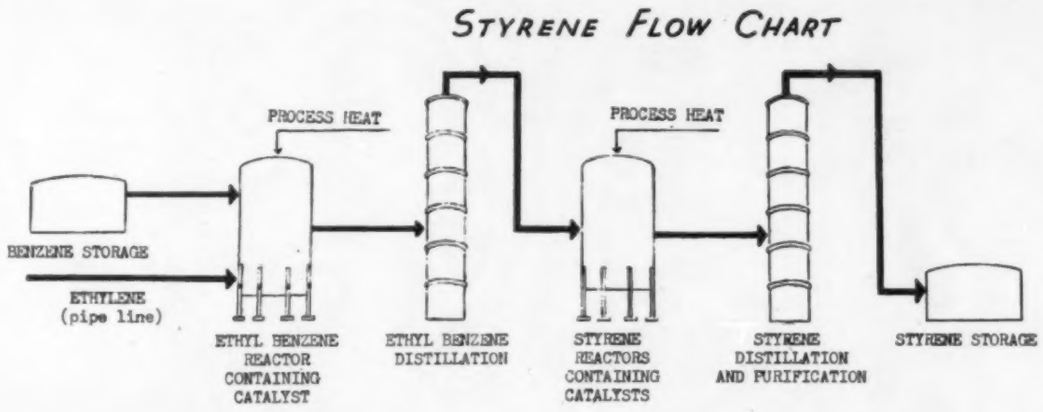


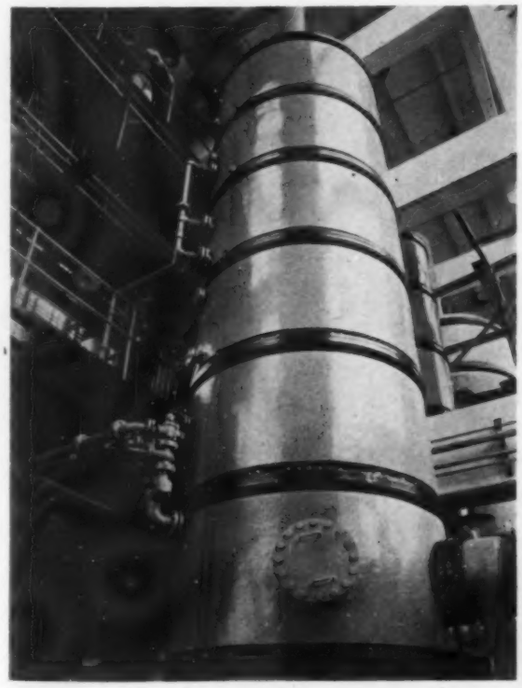
After reaching the specified purity, the butadiene is stored in these large spheres, each of which holds approximately 250,000 gallons.

Synthetic Rubber at Institute (Cont'd)



Ethyl benzene, produced at the Carbide plant, is turned into styrene by the use of heat, pressure and catalysts in these special converters. Carbide produces its own ethylene gas at a plant six miles from Institute, this gas being piped direct to the Institute plant. Benzene is purchased from outside sources.

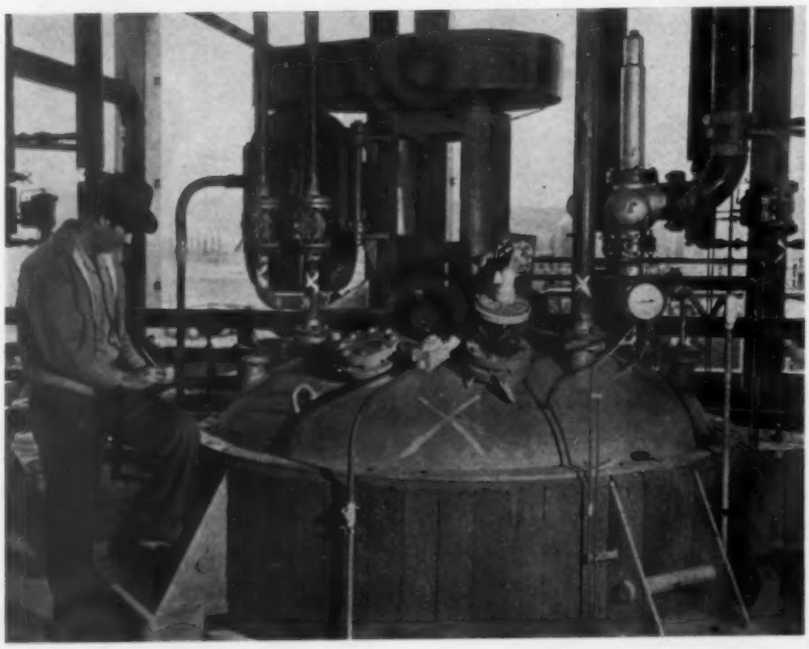




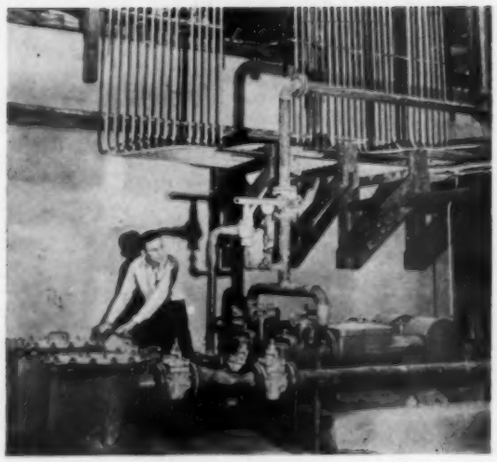
After the styrene has been formed in the reactors, it is purified by distillation and stored in tanks for delivery to the copolymer plant. One of the styrene distillation units is shown at the left. The styrene unit at Institute has a rated capacity of 25,000 short tons per year, which is divided into twin plants, each with a capacity of 12,500 tons.

COPOLYMERIZATION

Sufficient storage capacity is provided at the copolymer plant at Institute, operated by U. S. Rubber, to keep the plant running for three days. There are nine 30,000-gallon tanks for butadiene and three 30,000-gallon tanks for styrene, both being pumped direct to the copolymer plant from the Carbide plant. Some of the storage units are seen at the left.



The actual start of GR-S begins in the reactor vessel above, in which three parts of butadiene and one of styrene are mixed with seven parts of soapy water, then being subjected to heat after the catalyst has been added. This phase results in solid rubber-like particles.

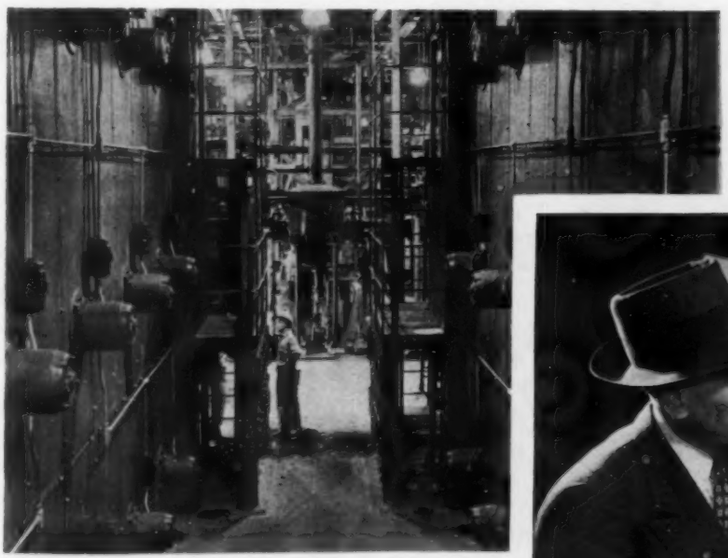


After unreacted butadiene and styrene are boiled off and recovered for reuse, the emulsion is pumped to large blending tanks (right) where it is mixed with other batches for the sake of uniformity. The rubber content of the emulsion is then coagulated and separated in the form of flocs or crumbs.

Synthetic Rubber at Institute (Cont'd)

Left: After certain dilute chemicals have been recovered, the synthetic rubber in the form of flocs or crumbs is thoroughly washed and excess water removed.

Right: Following the washing operation, the rubber is conveyed in the form of a blanket to machines which reduce it to smaller particles before drying.



Left: The rubber is dried by passing back and forth three times in the 12 large driers installed at the Institute plant. At full operation, these driers will evaporate 160 tons of water per day.

Right: The dried rubber is fed directly to automatic balers which turn out bales measuring 18 x 28 x 6 inches, weighing approximately 75 pounds. 9,000 such bales can be turned out daily. George A. Graham, factory manager of the copolymer plant, is examining one of the bales.

KEM-POL—
Properties, Characteristics and Applications

By W. T. WALTON

Allied Research Labs.,
Sherwin Williams Co.,
Chicago, Illinois

THE Kem-Pols are vulcanizable polymers derived from vegetable oils. They are intended for use as substitutes, replacements, and extenders for natural, synthetic and reclaimed rubbers in those cases where lower tensile strength and elongation are permissible. Critical chemicals are not used in the manufacture of the Kem-Pols. Existing equipment is available for their manufacture in large quantities. Availability will be limited only by the supply of domestic oil but, undoubtedly, the relative importance of the uses to which the Kem-Pols are put must be considered as influencing the amount of oil to be secured.

The Kem-Pols should serve as replacements and extenders for natural, synthetic and reclaimed rubber in a wide variety of war and civilian applications. Their use as rubber replacements is indicated where rubber has been denied, and as extenders in those places where their incorporation enhances or does not deteriorate the finished article. A few suggested uses are: Treads, mats, hose, rolls, braided tubing, pads, erasers, food closures, jar rings, gaskets, insulation, felting, fabric coatings, tapes, sheetings, beltings, sealing compounds, stoppers, adhesives, and cements.

Note: This article was the basis for a talk given by the author before the New York Group, Rubber Division, A.C.S., in New York City, on June 11, 1943.

TABLE I—PHYSICAL TESTS ON KEM-POL 11

	SW-1	SW-2
Kem-Pol 11	100	100
P-33	80	80
Zinc Oxide	5	5
Sulfur	4	4
Captax	2	2
AgeRite Resin D	1	1
Stearic Acid	2	2
	194	194
Baking Temp.	225° F.	250° F.
Baking Time	4 hrs.	2½ hrs.

Cure 287° F.	SW-1 Tens. psi	SW-1 % Elong.	SW-1 % Set	SW-1 Hard.	SW-2 Tens. psi	SW-2 % Elong.	SW-2 % Set	SW-2 Hard.
30′	370	100	3	62	299	110	3	65
40′	368	110	5	60	370	110	3	65
50′	370	110	3	60	372	110	3	65
Sp. Gr.		1.347				1.35		
2 Days in Oxygen Bomb at 80° C. and 50 lbs. Pressure								
40′ @ 287° F.	530	80	3	78	495	70	3	82
7 days Oven Aging at 70° C. (158° F.)								
40′ @ 287° F.	440	100	3	69	495	90	4	71

TABLE II—PHYSICAL TESTS ON KEM-POL 54

	SW-3	SW-4
Kem-Pol 54	100	100
P-33	80	80
Zinc Oxide	5	5
Sulfur	4	4
Captax	2	2
AgeRite Resin D	1	1
Stearic Acid	2	2
	194	194
Baking Temp.	225° F.	250° F.
Baking Time	4 hrs.	2½ hrs.

Cure 287° F.	SW-3 Tens. psi	SW-3 % Elong.	SW-3 % Set	SW-3 Hard.	SW-4 Tens. psi	SW-4 % Elong.	SW-4 % Set	SW-4 Hard.
30′	305	130	6	55	210	145	6	42
40′	303	130	6	56	184	135	4	42
50′	310	125	4	58	200	135	4	42
Sp. Gr.		1.35				1.34		
2 Days in Oxygen Bomb at 80° C. and 50 lbs. Pressure								
40′ @ 287° F.	390	100	3	70	347	100	3	64
7 days Oven Aging at 70° C. (158° F.)								
40′ @ 287° F.	440	95	3	65	290	125	3	54

Physical State

There are, at present, four members of the Kem-Pol family. They are as follows:

Kem-Pol #14: A viscous liquid, amber in color. It is easily soluble in aliphatic and aromatic hydrocarbons and may be emulsified. It is intended for use as an adhesive and is not recommended for the preparation of mill stocks or molded articles.

Kem-Pol #54: This Kem-Pol is of intermediate viscosity. It is a viscous, tacky, semi-solid, gel-like material. It is also soluble in aromatic and aliphatic hydrocarbons and will emulsify. Its color is the same as that of Kem-Pol #14. It may be used as an adhesive, or may be cured as described later and milled and molded. However, its preferred use is in adhesives.

Kem-Pol #11: This is the most viscous of the untreated polymers. It is a tacky solid and is darker in color than the two polymers previously mentioned, being ruby red rather than amber by transmitted light. It is soluble with difficulty, if at all, in aromatic hydro-

carbons. It can be emulsified. Its preferred use is in the preparation of mill stocks and molded goods, although it may also be used in adhesives.

Kem-Pol #11-41 MP: This Kem-Pol is offered for those who do not find it convenient to handle the viscous, tacky polymers mentioned above. It is based on Kem-Pol #11 and represents this polymer in a precured state. It is a dry, cream to tan colored sheet, which has only a slight tack. It differs from the other polymers in that it may be worked directly on the rubber mill, without pretreatment. Resultant stocks will have about the same properties as those prepared from Kem-Pol #11.

Compounding Kem-Pol #11 and Kem-Pol #54

Kem-Pol is not rubber; therefore, certain departures from standard rubber procedures of compounding and curing are necessary and advisable. Previous rubber experience may be used as a starting point and guide, but variations from established practice may result in improved performance.

Kem-Pols #11 and #54 are too tacky to be compounded on an open mill and must be dried before milling by pigmenting and precuring or precuring alone, after which the product may be milled and further compounded quite readily. This operation can be carried out in any heavy duty internal mixer. The Werner-Pfleiderer type is well suited for the operation.

Pigmentation and Bake Out Method: A suitable formula would be:

Kem-Pol #11 or #54	100
Carbon Black	80
Zinc Oxide	5
Sulfur	4
Accelerator	2
Antioxidant	1

Charge one-half the Kem-Pol into a heavy duty mixer and add the dry ingredients slowly. When all are in and the mix is homogeneous, work in the remaining Kem-Pol. The pigmented Kem-Pol is then sheeted in pans and baked.

Baking: The most important step in handling Kem-Pol is the baking operation. An exothermal reaction takes place during baking. It is therefore advisable to have the thickness of the batch as uniform as possible. If the batch is baked too short a time, it is too soft to handle; if baked too long, it becomes short or dry. It is therefore necessary to choose a baking temperature that gives a controllable product. Kem-Pol batches can be baked at temperatures ranging from 225° to 300° F. A baking schedule might be:

225° F.—4 to 5 hours
250° F.—3 hours
300° F.—1½ hours

At 300° F. the baking time is short but over baking is possible if conditions are not carefully controlled. A baking temperature of 250° F. is recommended since

TABLE III—CHANNEL BLACK IN KEM-POL 11

	SW-5	SW-6
Kem-Pol 11	100	100
Channel Black	50	67
Zinc Oxide	5	5
Sulfur	4	4
Captax	2	2
AgeRite Resin D	1	1
Stearic Acid	2	2
	164	181
Cure: 40' @ 287° F.		
Tensile (psi)	310	285
Elongation (%)	105	60
Set (%)	5	3
Hardness	62	74
Sp. Gr.	1.24	1.27
2 Days in Oxygen Bomb at 80° C. and 50 lbs. Pressure		
Tensile (psi)	465	540
Elongation (%)	65	60
Set (%)	3	6
Hardness	80	87
7 Days Oven Aging at 70° C. (158° F.)		
Tensile (psi)	310	430
Elongation (%)	100	90
Set (%)	4	6
Hardness	62	72

TABLE IV—EFFECT OF KEM-POL #11 ON GR-S

	1	2	3	4
GR-S	100.	100.	100.	100.
Soft Channel Black	50.	50.	50.	50.
Zinc Oxide	5.	5.	5.	5.
Sulfur	2.	2.	2.	2.
Captax	1.5	1.5	1.5	1.5
DPG	0.15	0.15	0.15	0.15
Kem-Pol 11	...	10.	20.	30.

Cure 298° F.	Mod. 300%	Ten.	% El.	% Set	Mod. 300%	Ten.	% El.	Set	Mod. 300%	Ten.	% El.	% Set	Mod. 300%	Ten.	% El.	% Set
10'	507	1630	595	22	330	700	545	24	189	425	615	..	213	635	760	48
20'	1100	2225	465	16	700	1685	555	22	475	1270	640	..	415	1325	730	34
30'	1405	2635	455	15	1025	1900	490	18	585	1740	685	..	600	1525	675	30
40'	1560	2075	340	12	1140	2040	475	15	600	1830	600	..	650	1530	625	30
50'	1685	1915	345	10	1190	2170	480	17	765	1765	580	..	660	1550	610	30
60'	1795	1885	325	8	1300	1900	425	12	725	1535	640	..	675	1375	575	24
Hardness																
10'		56				55				52				50		
20'		62				61				60				60		
30'		65				65				62				61		
40'		65				65				65				65		
50'		67				67				65				65		
60'		67				65				65				65		

TABLE V—V-15568 AND RUBBER SUBSTITUTE IN GR-S

	5	6
GR-S	100.	100.
Soft Channel Black	50.	50.
Zinc Oxide	5.	5.
Sulfur	2.	2.
Captax	1.5	1.5
DPG	0.15	0.15
V-15568	....	20.
Rubber Substitute	20.	....

Cure 298° F.	Mod. 300%	Tens. psi	% Elong.	% Set	Mod. 300%	Tens. psi	% Elong.	% Set
10′	690	1735	570	30	365	1510	725	39
20′	1150	2415	580	24	527	1850	705	36
30′	1260	2400	480	24	575	1725	630	30
40′	1350	2310	465	18	640	2035	640	30
50′	1420	2510	470	18	800	2030	630	30
60′	1500	2415	425	18	790	1830	565	24
			Hardness					
10′			54				59	
20′			60				62	
30′			62				64	
40′			62				65	
50′			63				67	
60′			65				67	

this temperature permits adequate control without requiring excessive time for completion of the batch.

A batch which is too soft should be given an additional bake. A hot air oven or steam jacketed heater may be used for baking. Heating the batch in open steam is not recommended.

Occasionally, baked batches may be lumpy due to variations in temperature, pigment dispersion, local overheating, etc. Such batches may be refined to give a smooth product. Refined batches, whether they are lumpy or not, always extrude at greater speeds than the unrefined batch.

After baking, Kem-Pol batches can be handled on the mill like rubber or reclaim. The baked compound can be modified by addition of fillers, softeners, etc. This is an extra milling operation and can generally be eliminated by adding all the compounding ingredients prior to baking.

Pre-Cure Method: A suitable formula might be:

Kem-Pol #11	100
Zinc Oxide	6
Sulfur	4
Accelerator	2
Antioxidant	1

The above ingredients are mixed in a steam-jacketed, heavy-duty mixer until smooth and homogeneous. Steam (50-80 lbs.) is admitted to the jacket and the batch agitated until dry enough to mill on a cold mill without sticking (15-45 min.). The batch is dumped from the mixer and left to cool. This material may then be pigmented on an open mill, fillers and softeners may be added.

Fillers: Soft carbon blacks are preferred in Kem-Pol because higher loadings can be used than is the case with reinforcing blacks. Soft carbon blacks give products that are softer and more flexible. Where the end use does not permit the use of soft carbon blacks, a lower loading of channel black may be used. Other fillers such as whiting, clay, blanc fixe, barytes, titanium dioxide, lithopone may also be used to give light colored compounds.

Molded Products: Kem-Pol should be cured in molds that are not too complicated in design. The molds should be equipped with split center plates and be free from undercuts. The preferred cure is 25 to 40 minutes at 287° F. Too high curing temperatures may result in blisters.

Extruded Products: Kem-Pol compounds may be extruded and cured in open steam to give a wide range of products such as baby cab tires, tubing, gaskets, shims, seals, etc., in various sizes. The optimum cure is 25 to 40 minutes at 287° F. depending on the thickness of the product. Kem-Pol products improve in tensile strength with age. Maximum pliability can therefore be obtained by giving them an undercure.

Calendered Products: Kem-Pol compounds can be frictioned and coated on fabric to give coated fabrics for a variety of applications. The coated fabric may be cured in hot air or open steam. The cure should be on the underside.

TABLE VI—EFFECT OF EXTENDERS ON AGING OF GR-S

(Oxygen Bomb Aging)

GR-S	100.
Soft Channel Black	50.
Zinc Oxide	5.
Sulfur	2.
Captax	1.5
DPG	0.15
Extender	(as indicated)

Comp. No.	Cure 298° F.	Extender	Original Mod. 300%	Original Tens. psi	Original % Elon.	Original % Set	2 days oxygen bomb 80° C., 50# pressure Mod. 300%	2 days oxygen bomb 80° C., 50# pressure Tens. psi	2 days oxygen bomb 80° C., 50# pressure % Elon.	2 days oxygen bomb 80° C., 50# pressure % Set	% Decrease Tens.	% Decrease Elong.
1	30′	None	1405	2635	455	15	....	2040	280	7	22.5	38.4
2	50′	Kem-Pol 11 10 parts	1190	2170	480	17	1595	1850	390	9	14.7	18.7
3	40′	Kem-Pol 11 20 parts	600	1830	600	30	1020	1720	480	22	6.0	20.
4	50′	Kem-Pol 11 30 parts	660	1550	610	30	800	1577	555	24	+ 1.7	9.0
5	50′	Rubber Sub. 20 parts	1420	2510	470	18	1927	2308	350	8	8.0	25.5
6	40′	V-15568 20 parts	640	2035	640	30	878	1643	485	4	19.2	24.2

TABLE VII—EFFECT OF EXTENDERS ON AGING OF GR-S

(Oven Aging)

GR-S	100.
Soft Channel Black	50.
Zinc Oxide	5.
Sulfur	2.
Captax	1.5
DPG	0.15
Extender	(as indicated)

Comp. No.	Cure 298° F.	Extender	Original Mod. 300%	Original Tens. psi	Original % Elon.	Original % Set	7 Days in oven at 158° F. Mod. 300%	7 Days in oven at 158° F. Tens. psi	7 Days in oven at 158° F. % Elon.	7 Days in oven at 158° F. % Set	% Change Tens.	% Change Elong.
1	30′	None	1405	2635	455	15	....	1760	280	6	—33.2	—38.4
2	50′	Kem-Pol 11 10 parts	1190	2170	480	17	1550	2280	395	10	+ 5.	—17.7
3	40′	Kem-Pol 11 20 parts	600	1830	600	30	910	1860	590	17	+ 1.6	— 1.6
4	50′	Kem-Pol 11 30 parts	660	1550	610	30	780	1575	540	24	+ 1.6	—11.4
5	50′	Rubber Sub. 20 parts	1420	2510	470	18	1735	2530	400	14	+ 0.8	—14.8
6	40′	V-15568 20 parts	640	2035	640	30	965	1770	500	21	—13.0	—21.8

Physical Properties

Tables I, II and III illustrate the properties of Kem-Pol compounded on a typical formula both with furnace black and with channel black. Results are as follows:

1. On properly handled stocks, tensile factor averages about 400. Tensile strength varies from 300 to 500 lbs. psi and elongation from 100 to 130%. Hardness varies from 40 to 65.

2. Furnace blacks yield better stocks than channel black.

3. On aging, tensile strength increases about 40%, elongation decreases about 30%, and hardness increases about 30%.

Chemical and Solvent Resistance

Resistance to the solvents and reagents is as shown below:

Cold Water	Excellent
Boiling Water	Slight change in 48 hours
Lubricating Oil (SAE 20) room temp.	Excellent
Vinegar	Good
2% Ivory soap solution, room temp.	Good
2% Ivory soap solution, 158° F.	Poor
Gasoline, room temp.	Poor, swells
Ethylene glycol, room temperature	Excellent

Kem-Pol #11 as an Extender in GR-S

Extenders may be added to GR-S to improve its tackiness and smoothness as well as to extend the supply without too greatly impairing physical qualities. Extenders vary in consistency from liquids, and viscous liquids, to elastic solids. A viscous liquid extender may decrease the tensile strength of GR-S more than an elastic solid, but it may be expected to impart greater tackiness and softness.

Ten, 20 and 30 parts of Kem-Pol #11 were added to 100 parts of GR-S, and compared with 20 parts of V-15568, which is a modified alkyd resin, and 20 parts of rubber substitute. The rubber substitute is an elastic solid and was selected as representing that type of extender.

Kem-Pol #11 softens and imparts tackiness to GR-S. This is a distinct aid in obtaining adhesion between plies and cohesion in molding. Kem-Pol #11 gives smooth GR-S compounds. It gives greater tackiness to GR-S than V-15568 or rubber substitute.

The following base compound was used in this study:

GR-S	100.
Soft Channel Black	50.
Zinc Oxide	5.
Sulfur	2.
Captax	1.5
DPG	0.15
Kem-Pol #11	(as indicated)
Rubber Substitute	(as indicated)
V-15568	(as indicated)

Plasticity: Plasticity of the milled batches was determined on the Firestone Extrusion Plastometer:

1. Kem-Pol #11 increases the plasticity of GR-S. Increase in plasticity is proportional to the amount of Kem-Pol #11 added.

2. 20 parts of V-15568 gives about the same plasticity as 20 parts of Kem-Pol #11.

3. Rubber substitute does not soften or increase the plasticity of GR-S as much as Kem-Pol #11. 10 parts of Kem-Pol #11 gives a softer and more plastic stock than 20 parts of rubber substitute.

Firestone Extrusion Plastometer
Temperature Upper and Lower Plate
180° Pressure 7½ Lbs.

No.	*Extender*	*Amount of Extender on 100 parts of GR-S*	*Plasticity*
1	None	None	40
2	Kem-Pol #11	10	29
3	Kem-Pol #11	20	23
4	Kem-Pol #11	30	20
5	Rubber Substitute	20	33
6	V-15568	20	25

Processing: Kem-Pol #11 and rubber substitute are easily incorporated into GR-S. The higher the percentage of Kem-Pol #11, the smoother the batch. V-15568 mixes into GR-S much more slowly on the mill than Kem-Pol #11. Mixing in an internal mixer would overcome this difficulty.

Bloom: Kem-Pol #11 and V-15568, in the proportions used, show no tendency to bloom to the surface of either the uncured or cured GR-S stock. There is no oil or greasy matter which blooms out and interferes with knitting of the stock during molding, or affects the appearance of the finished product.

Tackiness: Kem-Pol #11 and V-15568 impart tackiness to GR-S. Tack is proportional to the amount of Kem-Pol #11 which is added. Kem-Pol #11 is definitely superior to rubber substitute in this respect.

Since Kem-Pol #11 increases plasticity and improves smoothness and tackiness, it is definitely an aid in calendering, tubing, and molding of GR-S compounds.

Physical Tests (Tables No. IV and V):

1. Kem-Pol #11 and V-15568 decrease the rate of cure of GR-S.
2. The modulus at 300% and tensile strength of GR-S is decreased.
3. Per cent elongation and permanent set at break are increased.
4. Effect of the addition of Kem-Pol #11 is proportional to the amount added.
5. For stocks of this hardness, except on undercures, the hardness of GR-S remains practically unchanged with increasing amounts of Kem-Pol #11.
6. Rubber substitute, an elastic solid, does not decrease the modulus or tensile strength as much as Kem-Pol #11. It gives a lower per cent elongation and a softer stock than Kem-Pol #11.

Oxygen Bomb Aging (Table No. VI):

1. The addition of Kem-Pol #11 to GR-S improves the aging as judged by per cent decrease in tensile strength and elongation after two days aging in the oxygen bomb at 80° C. and 50 lbs. pressure.
2. GR-S compounds containing Kem-Pol #11 give lower initial tensile strength than when none is present, but deterioration, or the decrease in tensile strength and elongation, decreases as the amount of Kem-Pol #11 is increased.
3. GR-S compounds containing rubber substitute and V-15568 show less deterioration than GR-S alone, but they are not as good as Kem-Pol #11. Rubber substitute does not give as high an elongation as Kem-Pol #11 either before or after aging.

Oven Aging (Table No. VII):

1. GR-S compounds containing varying amounts of Kem-Pol #11 show improved oven aging after 7 days at 158° F. (70° C.).
2. The initial tensile strength of GR-S is higher than when Kem-Pol #11 is used, but the tensile strength of the GR-S compounds containing Kem-Pol #11 are all higher than they were originally.
3. Rubber substitute improves the oven aging of GR-S.
4. V-15568 improves the oven aging of GR-S but it is not as good as an equivalent amount of Kem-Pol #11 or rubber substitute.

Hardness (Table No. VIII):

1. GR-S stocks, of the hardness range covered by this work, are not decreased in hardness by the addition of various amounts of Kem-Pol #11 or V-15568. They are softened somewhat by rubber substitute.
2. After 2 days in the oxygen bomb: (a) Stocks containing 20 and 30 parts Kem-Pol #11 and 20 parts rubber substitute are slightly softer than GR-S alone; (b) V-15568 gives a slightly harder stock than GR-S alone.
3. After 7 days oven aging: (a) 20 parts rubber substitute gives a slightly softer stock than 20 or 30 parts of Kem-Pol #11; (b) V-15568 gives a slightly harder stock than GR-S alone.

Resistance to Tear (Table No. IX):

1. Ten, 20 and 30 parts of Kem-Pol #11 and 20 parts of V-15568 improve the resistance to tear of GR-S both before and after 2 days in the oxygen bomb at 80° C. and 50 lbs. pressure.
2. Rubber substitute shows some improvement to tear on the 40 minute cure, but decreased resistance on the 30 and 50 minute cures.
3. Rubber substitute does not give as good resistance to tear after oxygen bomb aging as Kem-Pol #11.

TABLE VIII—EFFECT OF EXTENDERS ON AGING OF GR-S

(Hardness)

GR-S	100.
Soft Channel Black	50.
Zinc Oxide	5.
Sulfur	2.
Captax	1.5
Extender	(as indicated)

Comp. No.	Cure 298° F.	Extender	Original	2 days oxygen bomb at 80° C. 50 lbs.	7 days in oven at 70° C.
1	30′	None	65	70	72
2	50′	Kem-Pol 10 parts	67	70	72
3	40′	Kem-Pol 20 parts	65	68	69
4	50′	Kem-Pol 30 parts	65	68	69
5	50′	Rubber Sub. 20 parts	63	68	68
6	40′	V-15568 20 parts	65	71	73

Low Temperature Tests

Grommets were cured from compounds 1 to 6. 30 minutes at 316° F. Hardness was determined before and after 4 hours exposure at —65° F. The addition of 10, 20 and 30 parts of Kem-Pol #11 to 100 parts of GR-S has no appreciable effect on hardness at —65° F. 20 parts of V-15568 and rubber substitute are slightly harder at —65° F. than 20 parts of Kem-Pol #11. All of the compounds harden appreciably when exposed to —65° F. The hardening of GR-S at low temperatures is not adversely affected by the addition of Kem-Pol #11.

Compound	Hardness, Room Temperature	Hardness after 4 Hours at —65° F.
1	63	95
2	63	95
3	61	95
4	61	96
5	61	97
6	66	96

Sunlight Aging

GR-S compounds 1 to 6 containing Kem-Pol #11, V-15568 and rubber substitute were given a weathering test by mounting strips at a 45 degree angle with a southern exposure. Test strips 1" x 6" were folded in two loops and fastened to a test board. The smaller loop was prepared around a ¼" rod to give maximum tension. The larger loop was under minimum tension.

All samples showed cracking in 3 days (May 22nd to 25th) on both loops. During the test there was only a few hours of sunshine on May 25th. All samples were badly cracked on the small loop. On the exposed or top side of the large loop, all samples except those containing 20 and 30 parts or Kem-Pol showed cracking in 3 days. The underside of the large loop showed cracking on all compounds in three days.

Kem-Pol #11 has no effect on the sunlight aging of GR-S, which, like rubber, requires an amorphous wax to give good aging in sunlight.

Kem-Pol in Adhesives

Kem-Pol polymers #14 and #54 are suitable as basis for adhesives and cements of the solution type. They are soluble in aromatic hydrocarbon solvents and aliphatic hydrocarbon solvents, even of low kauributanol value. The following procedure is suggested for dissolving these polymers in solvent:

The Kem-Pol is put into a heavy duty mixer and kneaded by means of agitation until soft. Solvent is added slowly, at such rate that no large quantity of free solvent is present at any time. Solvent additions are continued until a solution of the desired non-volatile content has been prepared.

Kem-Pols #14, #54 and #11 may all be emulsified very easily. Many emulsifying agents will yield a satisfactory emulsion. Even 0.5% 28° Be ammonia, based on polymer weight, is satisfactory. These emulsions are quite stable, but may be further stabilized by the addition of protective colloids, as casein or protein solutions.

The following procedure is suggested for the preparation of a Kem-Pol emulsion: Kem-Pol polymer is put into a heavy duty mixer, emulsifying agent is added and the two kneaded by means of agitation until soft. Water is then added slowly so that no large quantity of free water is present at any time. Water additions are continued until an emulsion of the desired non-volatile content has been prepared.

TABLE IX—EFFECT OF KEM-POL, V-15568 AND RUBBER SUBSTITUTE ON RESISTANCE TO TEAR OF GR-S

(Crescent Method—Lbs. Per Inch Thickness)

Comp. No.	Extender	Cure 298° F.	Original	2 days oxygen bomb 80° C. 50# Pressure
1	None	30′	227	245
		40′	222	...
		50′	222	...
2	Kem-Pol 11 10 parts	30′	294	...
		40′	333	...
		50′	350	347
3	Kem-Pol 11 20 parts	30′	301	...
		40′	340	397
		50′	348	...
4	Kem-Pol 11 30 parts	30′	305	...
		40′	336	...
		50′	270	396
5	Rubber Sub. 20 parts	30′	202	...
		40′	258	...
		50′	172	223
6	V-15568 20 parts	30′	421	...
		40′	329	264
		50′	288	...

New Bullard Rubber Lung

LIVES of industrial workers may be saved by unskilled helpers through use of the Rubber Lung, a revolutionary device for administering artificial respiration, introduced by the E. D. Bullard Company, San Francisco, Calif., manufacturers of industrial safety equipment. The Rubber Lung is recommended to supplement and increase the effectiveness of Schaefer prone pressure treatment to restore breathing suspended through shock, fumes and gases, drowning, etc.

The device is strapped to the back or stomach of the victim and adheres to the body through suction. Raising and lowering the Lung Handle at normal breathing rate activates the muscles of the victim, causing them to draw in and exhale air. Differing from mechanical resuscitators, the Rubber Lung does not force air in and out of the lungs, but stimulates action of the normal body muscles, helping them to do the work required for breathing until they regain strength to do this work without assistance.

Because of the gentle, natural breathing stimulus, the Rubber Lung may be used safely by even a totally inexperienced person. The only point that must be watched is timing, to assure a rhythm as close to normal breathing as possible. In any hands, under any condition, there is no danger of doing harm to the patient. The device is entirely foolproof.

Competent medical authorities state that the Rubber Lung supplements and increases the efficiency of the Schaefer Method and is superior in ease of operation, simplicity of construction, safety and speed.

Lining Fuel Storage Tanks with Synthetic Rubber Sheet

By JOSEPH W. CROSBY

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EARLY in 1940 the Bureau of Yards and Docks of the Navy Department began to visualize a possible shortage of steel plate for purposes other than for war construction for which there were no available substitutes. The increased demand for greater fuel storage facilities and the advisability of protecting storage areas by underground concealment pointed to a huge demand for structural steel in the construction of these storage facilities for oils and gasolines. In an effort to institute savings in the use of this much needed steel, studies on the use of reinforced concrete tanks for fuel storage purposes were made. The answer obtained was the use of what is termed "prestressed" concrete tanks, which are now being installed in Naval bases throughout continental United States.

While structural obstacles had to be overcome in the construction of these tanks, the Bureau of Yards and Docks engineers were convinced that concrete underground storage tanks could be constructed to successfully retain the heavy fuels. The matter of retaining the less viscous fuels, such as diesel oil and aviation gasoline, presented a serious problem. This problem was solved and credit for the successful adaptation of the use of concrete tanks for the storage of gasoline resulted from the development of various types of synthetic linings.

The columns of the concrete underground tanks are covered with the sheet material to prevent the gasoline from coming in contact with free alkalies in the concrete which would lower its octane rating, thus depreciating its value.

On installing Thiokol FA linings in concrete tanks for aviation gasoline, the walls are first covered and allowed to lap over six inches onto the floor. Then, after the floor has been covered, a corner strip is superimposed over the joint to insure against possible leakage.

Among these linings developed was a thin sheet of Thiokol FA, which requires application to walls, floors, and columns like wallpaper. This type of lining protected the gasoline from a drop in octane rating which may have occurred by being exposed to the alkalies present in the concrete. In addition to reducing the loss in octane rating and the formation of gum in the gasoline, the Thiokol sheeting also serves to prevent loss of fuel by seepage through porosity in the concrete walls. The synthetic Thiokol FA sheet linings used by the Bureau of Yards and Docks were formulated by the Boston Woven Hose and Rubber Company after much experimentation with adhesives for the application of the linings to the concrete sidewalls, floors, and columns of the tank.

The synthetic sheet consists of a high density sheet of the Thiokol FA—a polysulfide synthetic rubber which may also be used for the fabrication of hose and other solvent-resistant specialty products. The sheets used in the tank construction were required to be made in two thicknesses, .025 inch for sidewalls and columns,

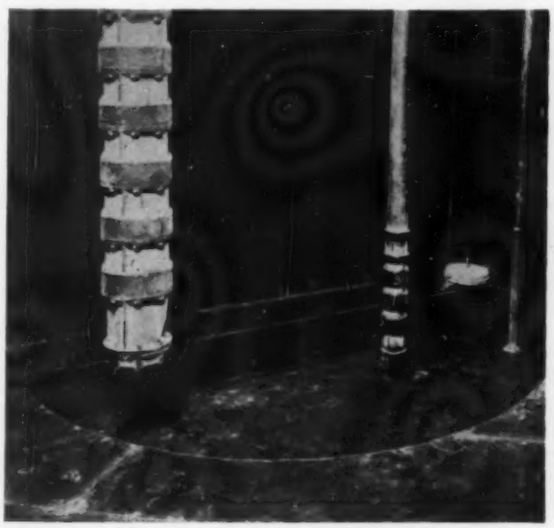
and .03 inch for floor coverings. The sheets are 38 inches wide and made in 100 yard rolls. The front surface is smooth, except for a 3 inch strip along one side, which like the back surface is rough to provide better lap adhesion.

Production of the lining involved several new fabrication problems. After the crude stock is mixed in a Banbury mixer, it is calendered into sheets and wound in rolls with an interliner to prevent sticking. Without removing the interliner it is air cured for 15 minutes at 320° F. The interlining is then removed and the sheet is fed into a continuous curing press. It is this process, which takes about two minutes, that gives the sheeting its high density and strength characteristics. The final step is buffing and measuring, followed by inspection over a light box. Every foot of the material is so inspected since the slightest pinhole would permit gasoline to come in contact with the concrete. Careful inspection is most important and is carefully watched.

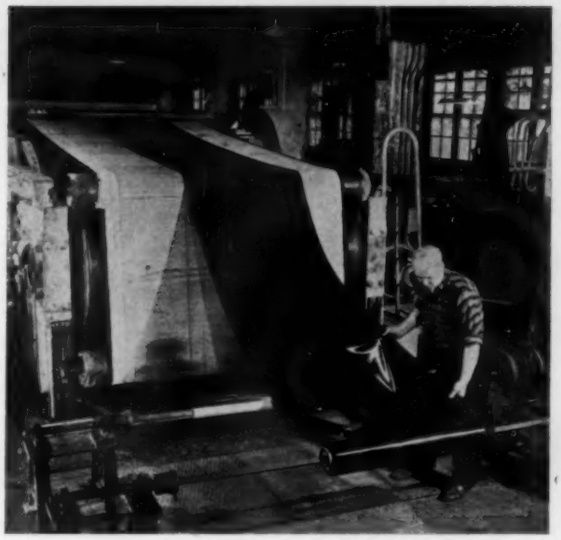
Installation Is Complicated Procedure

Installation of the Thiokol FA lining in many ways resembles the hanging of wallpaper, but in actuality is a far more complicated operation. After all holes have been filled and all projections removed from the concrete surfaces, walls, columns and floors are coated with a special synthetic rubber cement applied with a notched trowel. After this has thoroughly dried a second coat is applied to that portion of the wall which is to be lined immediately, and to the back of the Thiokol lining. Ventilators are then set up to exhaust the solvent from the cement.

When it reaches just the right stage of tackiness, the strip of lining is hung similar to a strip of wallpaper, starting at the top and allowing a 6-inch overlap onto the floor. Great care has to be taken to prevent the sheet from coming into contact with the wall out of place since the adhesion of the cement is so great that it is almost impossible to unstick it once it is stuck.



Even the sump at the base of the tank must be completely lined with Thiokol FA sheet. Fitting the lining around such areas is one of the major installation problems.



Thiokol FA sheeting for lining underground fuel storage tanks is seen here feeding off the curing press at the plant of the Boston Woven Hose and Rubber Co. at Cambridge, Mass. The rough surface strip along the right edge is for adhesion of the lap joint when the material is hung.

The sheets are brushed into contact with heavy brushes to insure perfect adhesion at all points.

After the walls are covered with each strip overlapping the next by three inches, areas around ladders, pipes and other protuberances are carefully patched so that not one square inch of the bare concrete is left exposed. The concrete columns supporting the roof are then similarly covered.

The final step is covering the floor. A slightly thicker Thiokol sheeting is used, and instead of running strips all the way across the bottom of the tank, pieces of not more than ten feet in length are patched together in the manner of flooring in order to insure a perfect fit around the base of the columns. A nine-inch-wide strip is then superimposed on the joint where the walls meet the floor.

In addition to providing resistance to aromatic gasoline and the water which is bound to collect in the bottom of the tank, the Thiokol FA sheeting offers the added advantage of forming a container which remains leakproof even in cases where the concrete wall cracks due to various stresses, ground shifts or temperature changes.

Tanks Offer Several Advantages

At the present time tank farms are being constructed using Thiokol sheet lining and other synthetic linings for concrete tanks in order to build up the gasoline and fuel oil reserve storage for the use of the Naval forces. Completely underground and indistinguishable from the air, these concrete tanks not only represent a vast saving in vital steel plate, but offer the added advantage of being practically invulnerable to fire from normal operational hazards, and because of concealment and disposition reduce possible loss from bombing attacks to a minimum. The size of the tanks is not of any special concern, because of the special method of application.

Preventing the Bacterial Oxidation of Rubber

By ALBERT E. DIMOND[1] and JAMES G. HORSFALL[2]

THE recent article by ZoBell and Grant *(3)* notes the attack of rubber by bacteria under conditions of high moisture. It is suggested that "the life of rubber products which come in contact with moisture may be prolonged if ways can be found to retard or prevent the activity of rubber oxidizing microorganisms."

In the compounding of rubber commercially, native rubber is mixed with a number of chemicals, each of which serves a specific purpose in the properties of the finished product. Among these are the accelerators *(4)* which lower the temperature and shorten the time for vulcanization and lengthen the life of rubber.

Two well-known accelerators are mercaptobenzothiazole and tetramethylthiuram disulfide. These compounds *(5)* have been tested for their ability to inhibit germination of fungi, and gross observations have been made on their ability to inhibit bacterial growth. Mercaptobenzothiazole, known to the rubber industry as Captax, is a moderately good fungicide, and tetramethylthiuram disulfide, known as Tuads, is excellent. The latter compound is now being marketed under still another trade name as a seed protectant and for the prevention of turf diseases. Both of these materials have been tested under the field conditions prevailing in Connecticut by the authors for their efficacy in controlling plant diseases. Mercaptobenzothiazole, while inferior to tetramethylthiuram disulfide, has given partial plant disease control.

These materials, when employed in the compounding of rubber, are intimately mixed with zinc oxide, which is itself a useful fungicide and seed protectant. From a knowledge of the formulae of these accelerators, it occurred to the authors that zinc oxide might react with mercaptobenzothiazole and with tetramethylthiuram disulfide and that the reaction products might differ in their anti-microbial potency.

Spore germination tests were set up, using the method of Horsfall, *et al (6)*. Glass slides were sprayed with aqueous suspensions of mercaptobenzothiazole and tetramethylthiuram disulfide, with and without zinc oxide, and with suspensions of zinc oxide alone. Each type of suspension was sprayed in a dosage series. The glass slides were allowed to dry, after which drops of a suspension of spores of the fungus, *Macrosporium sarci-*

TABLE 1

EFFECT OF ADDING ZINC OXIDE TO MERCAPTOBENZOTHIAZOLE ON THEIR ABILITY TO INHIBIT THE GERMINATION OF FUNGUS SPORES

Dosage of toxicant (γ per sq. cm.)		Percentage inhibition
Mercaptobenzothiazole		
864		100
432		96
216		4
108		1
Mercaptobenzothiazole + zinc oxide		
520	345	4
260	173	2
130	86	0
65	43	0
Zinc-oxide		
864		100
432		100
216		98
108		94

TABLE 2

EFFECT OF ADDING ZINC OXIDE TO TETRAMETHLYTHIURAM DISULFIDE ON THEIR ABILITY TO INHIBIT THE GERMINATION OF FUNGUS SPORES

Dosage of toxicant (γ per sq. cm.)		Percentage inhibition
Tetramethylthiuram disulfide *		
34.3		53
24.4		54
17.1		75
12.3		74
8.5		23
6.1		10
Tetramethylthiuram disulfide + zinc oxide		
8.6	69	99
6.1	49	50
4.3	34	24
3.1	25	15
2.2	17	6
Zinc oxide		
137		100
98		99
68		67
49		32

* The dosage-inhibition relation shown for tetramethylthiuram disulfide is characteristic. See Albert E. Dimond, James G. Horsfall, J. W. Heuberger and E. M. Stoddard, *Conn. Agr. Exp. Sta. Bul.* 451, pp. 649-652, 1941.

Note: This article is reproduced from *Science*, Vol. 97, No. 2510 (Feb. 5, 1943). It represents a contribution from the Department of Botany, University of Nebraska, N. S. No. 138, and was published with the approval of the director of the Connecticut Agricultural Experiment Station. Part of the data reported were obtained in the Department of Plant Pathology and Botany of the Connecticut Agricultural Experiment Station; the remainder at the University of Nebraska.

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(3) *Science*, Vol. 96, No. 379 (1942).

(4) Murrill, Paul I., *Chem. & Eng. News*, Vol. 20, p. 1361 (1942).

(5) The authors are indebted to Mr. F. E. Hutchins of the R. T. Vanderbilt Co. for supplying them with these compounds as well as the specially purified grade of zinc oxide used in the rubber industry.

(6) Horsfall, James G., Heuberger, J. W., Sharvell, E. G., and Hamilton, J. M., *Phytopath.*, Vol. 30, p. 545 (1940).

(7) Shimada, K., *J. Soc. Rub. Ind. Japan*, Vol. 10, pp. 431, 533 (1937); Ibid. Vol. 11, p. 1 (1938). Slipushkina, E., *Caoutchouc and Rubber (U.S.S.R.)*, No. 3, pp. 48-51 (1937); Trans. in *Rub. Chem. & Tech.*, Vol. 11, No. 1, pp. 210-13 (Jan., 1938).

naeforme, were placed on the dried residues of sprayed material. The slides were incubated for 18 to 20 hours and then counts were made of the percentage inhibition of spore germination.

These tests indicate that in compounding with zinc oxide, mercaptobenzothiazole becomes inactivated as a fungicide, whereas tetramethylthiuram disulfide does not. Since the presence of zinc oxide is absolutely essential to the successful compounding of rubber, it is evident that when mercaptobenzothiazole is used as an accelerator in rubber, it will be rendered wholly innocuous as an inhibitor of microorganisms, and that the resulting rubber will be susceptible to attack by microorganisms under the conditions noted by ZoBell and Grant.

On the other hand, it is evident that tetramethylthiuram disulfide retains a large part of its activity against microorganisms in the presence of zinc oxide.

That mercaptobenzothiazole, tetramethylthiuram disulfide and zinc oxide as such remain in vulcanized rubber is implied by the fact that their presence in rubber can be estimated quantitatively *(7)*. We may therefore conclude that accelerators incorporated into rubber in vulcanization at least partly remain in the manufactured product. Any anti-microbial properties possessed by an accelerator would be a decided factor in preventing bacterial oxidation of rubber.

In view of these results, it is clear that, when rubber is to be used under conditions where it is likely to be in contact with water over long periods or even intermittently (as in the tropics), tetramethylthiuram disulfide be used as an accelerator in preference to mercaptobenzothiazole, provided that other desirable properties are not sacrificed by this procedure.

Grinding Process Reconditions Rubber Rollers and Platens

IN the September, 1942, issue of RUBBER AGE we described a method of reconditioning rubber typewriter platens by means of a sand-blasting process. This process was developed by Messrs. Kemp and Malm of the Bell Telephone Laboratories and the method was recommended by the Office of Price Administration. Another method for prolonging the life of rubber ink rollers for offset presses and multigraph machines, as well as typewriter platens, was recently revealed by the Studebaker Corporation of South Bend, Indiana. This is a grinding process for reconditioning rollers which become out of round and platens which become pitted and grooved.

In developing its process, Studebaker repaired a discarded hand-type buffer motor (1/20 h.p. and 3,600 r.p.m.). To the side of the motor housing a steel bar which fits into the tool post on a lathe was fastened. The buffer wheel was replaced with a 4-inch Norton grinding wheel, different type wheels being used for soft and hard rubber rolls.

A light metal grinding wheel cover, built by hand, serves as a safety guard and controls the rubber grindings. This cover was designed with an exhaust tube to fit into the motor cover opening of a small used vacuum cleaner. When the grinder is operating, the cleaner accumulates the rubber grindings in the bag. The cover and cleaner are also mounted on the grinder motor housing.

When it is necessary to resurface a roller or platen the proper grinding wheel is selected and the grinder and cleaner are mounted on a lathe. The roller or platen is suspended between the lathe chuck and tail post. The speed of the lathe is geared to from 175 to 200 r.p.m. and the spindle must be turning in the same direction as the grinder. The grinder is moved along by the automatic feed. This particular lathe is used for many kinds of work in machine repair shops.

So that the operator need not remain with the machine during the grinding process, a steel rod, fastened to the carriage saddle, throws off the lathe operating switch when the grinder has been fed to the end of the roller or platen.

Typewriter platens are never ground unless they have deep pits or grooves. If the grooves are shallow, Studebaker mounts the platens in the lathe and smooths them up with emery cloth. It has been found that a little alcohol, a cloth and plenty of "elbow grease" will refinish a lot of platens satisfactorily. If a platen has been ground three or four times some difficulty may be experienced with the line spacing on ruled forms. If this develops, it is suggested that the machine be used on straight typing only. Very satisfactory results from the process are reported by Studebaker engineers.

Studebaker's reconditioning process involves a discarded motor, a used grinding wheel, a second-hand vacuum cleaner, and a bench lathe.

Editorials . . . . . .

Third Report

THE third progress report issued by William M. Jeffers since he assumed the post of Rubber Director is, naturally, the most encouraging one compiled. It gives definite assurance that the synthetic rubber program is being "bulled" through as originally recommended by the Baruch Committee, although it was of course "streamlined" to meet existing conditions. It is time to say, "Well done, Mr. Jeffers."

The report intimates that all plants in the synthetic rubber program will be in operation before the end of the current year. Here, again, is the cautiousness displayed heretofore by the aggressive Rubber Director. We suspect that Mr. Jeffers *knows* that these plants will be in operation before 1944 rolls around, but he uses the term "expected to be in operation." At this time, he states, 27 of the 84 separate units making up the 48 plants in the overall program are in operation or ready for operation. But the others are moving ahead with a speed which is truly amazing.

Now that the production facilities for the manufacture of synthetic rubber are virtually assured, the next problem facing the industry is one of application. It is no secret that considerable difficulties are involved in the compounding and processing of GR-S (Buna S). The technical staff of Rubber Reserve is constantly trying to improve the quality of the copolymer, while that of the Office of the Rubber Director is expending every effort to improve processing technique.

With such prominent technologists as Messrs. Shepard, Boss, Fisher, Babcock, and Wiegand, to mention but a few, giving practically their entire time to the problem, we feel that the ultimate solution is not too far off. The entire industry merits congratulations for its cooperation in freely giving and interchanging information.

Breakers Ahead

FOR THE PAST two years the rubber manufacturing industry in the United States has been greatly concerned with the availability of its basic raw material—rubber. The point has now been reached, or soon will be reached, when this problem will be completely solved, and the solution will bring a problem all of its own, namely, the capability of the industry to handle the available supply.

It now seems quite evident, barring earthquakes, fire, storms, and Congressional committees, that more than 750,000 tons of crude equivalent will be produced in the synthetic rubber plants during 1944. Add to this some 320,000 tons of reclaim and approximately 100,000 tons of crude, and you have a sizeable amount of rubber.

There is very reasonable doubt as to whether the rubber manufacturing industry has the manpower and equipment to handle a volume of over 1,000,000 tons of rubber annually. Then, again, there is equal doubt whether sufficient chemicals and compounding ingredients, other than carbon black, will be available, since many of the more popular accelerators and antioxidants, and particularly the plasticizers required by the synthetics, call for the use of materials which are still in the critical stage, such as aniline and formaldehyde.

The conclusion would seem to be that there will be little problem in getting rubber for military and essential civilian products by mid-1944, but the actual problems will be three-fold: (1) Manpower; (2) Machinery and Equipment; (3) Chemicals and Compounding ingredients. We believe, however, that there are now sufficient capable authorities in the Office of the Rubber Director with foresight enough to recognize these problems and—more important—to act on them today for tomorrow's security.

CURRENT NEWS OF THE MONTH

SYNTHETIC PROGRAM IN BEST SHAPE EVER ACCORDING TO THIRD PROGRESS REPORT

ALTHOUGH the rubber problem has not yet been completely solved, and the next four to six months will be the critical period, the program is in the best shape that it has ever been, according to the Third Progress Report issued by Rubber Director William M. Jeffers. The report, released on May 17, emphasizes the fact that many problems still must be solved, including the scheduling, production and rationing of synthetic rubber; developing the techniques of using it; deciding in what products specific synthetics should be used; and deciding upon improvements necessary to fill the most pressing needs. For the benefit of our readers, the report is reproduced in full on Page 266 of this issue.

In connection with the "streamlining" of the overall program, the report revealed that eight "refinery conversion" projects have been cancelled, that 64,000 tons of Butyl and 20,000 tons of neoprene plant capacity have been cancelled, that the production of Thiokol N has been curtailed, and that recommendations for additional plant capacity for the production of 109,800 short tons of butadiene, 33,600 short tons of styrene, and 140,000 long tons of copolymer have not been approved.

Construction Proceeding Well

Construction of all plants in the synthetic rubber program is proceeding well, according to the report, 27 of the 84 separate units making up the 48 plants in the program being already in operation or ready for operation. These plants have a capacity of 252,000 tons, 30% of the program, while 14% of the butadiene and 18% of the styrene programs are in operation. Because some savings have been possible against original requirements and because present estimates indicate a greater production of synthetic rubber in 1943 and a greater amount of crude rubber imports than was indicated in the previous progress report, the stockpile of rubber at the end of 1943 now is expected to be about 40,000 tons higher than previously estimated, or 142,000 tons. It is now believed that crude rubber imports during the current year will reach 54,000 tons.

The report points out that surveys indicate that 30,000,000 tires is the probable minimum replacement program that the country can get by with, even with general recapping, by maintenance of present driving speeds, and by keeping present conservation measures. It is essential, therefore, that the industry train new personnel in 1943 and put tire-making machinery back into condition for production. Unless this is done this year, the industry will be hard put to accomplish the planned program for next year.

In concluding his report, Mr. Jeffers admitted that Buna S is still not a perfect material, but pointed out that his technical staff is not waiting for improvements in the copolymers but has launched an intensive program to make the best use of the present materials.

Mr. Jeffers' latest report referred to the fact that present findings of the Army, based on results obtained with its test fleets, are that because of the heat generating characteristics of Buna S it will be necessary to use rayon instead of cotton cord in the carcasses of most large size heavy duty and combat tires.

In this connection, it has been learned that rayon producers have been asked to turn out these yarns in considerably heavier volume than had previously been anticipated. Instead of 150,000,000 pounds a year, the industry is being called on for an annual production of between 200,000,000 and 205,000,000 pounds. Most of this increased poundage will have to come from conversion of present facilities rather than the construction of new plants.

Controversy Seen Ended

It will be recalled that recent charges brought against the rubber program by Under-Secretary of War Patterson, to the effect that priorities granted to that program were interfering with the production of aviation gasoline to such an extent that it was delaying heavy bombing expeditions over Europe, ended in an agreement between the various officials involved to make a tour of the rubber and 100-octaine gas plants. This tour got under way on May 30, the party making it being comprised of Rubber Director Jeffers, Mr. Patterson, Under-Secretary of the Navy James V. Forrestal, and Ralph K. Davies, deputy petroleum administrator for war.

Before starting on the tour, which covered several states and which is believed to have settled for all time the question of priorities and to have put an end to charges and counter-charges, a joint statement was issued indicating that one-third of the government's rubber program has been completed, one-half of the aviation gasoline plants to meet expected eventual needs are in operation, and the naval escort ship program is proceeding at a high rate. Forty-five aviation gasoline plants are now in operation, it was said, although twice this number is required to meet the demands of the rapidly expanding air force.

Although no official report was issued as to the outcome of the tour, Mr. Jeffers indicated several times along the route of travel that "There won't be any further disagreements." Mr. Patterson's only comment was that "We expect to accomplish big things on this trip." The trip included stops at Baton Rouge, Lake Charles, Port Neches, and Houston.

Houston Plant Nearly Ready

The copolymer plant to be operated by the Goodyear Tire & Rubber Co. at Houston, Texas, is nearly complete and ready for production, according to a statement issued early this month by Goodyear officials. Production is expected to get under way by August 1. The plant is geared for 60,000 tons.

Comprising two 30,000-ton units, the plant will provide employment for about 600 persons. One feature of the plant is the fact that the process building of each unit will be without walls, increasing the structure's degree of safety and taking advantage of the benign climate of Texas.

Butadiene for the Houston plant will be supplied direct from the Sinclair Oil Co. refinery by pipe-lines, while styrene will come from the Dow Chemical plant at Belasco, Texas, and from the Monsanto Chemical plant at Texas City, Texas. Practically all of the pipe-lines are underground as an added safety feature.

Butadiene and Styrene

Completion of a fifth plant in Baton Rouge, La., to manufacture butadiene was announced by the Standard Oil Co. of Louisiana on May 24. The new plant's rated capacity of 15,000 tons a year is approximately equal to the combined capacity of the four other butadiene plants in the city. Of the five plants now

in production of butadiene at Baton Rouge, two were financed entirely by Standard Oil, two others were built or equipped cooperatively by the company and the Government, while the fifth is owned by the Defense Plants Corporation.

According to a statement made to stockholders of the Consolidated Oil Corp. on May 19 by H. F. Sinclair, president, the butadiene plant the company is building in Texas will be in production within two or three months. The company, incidentally, changed its name to the Sinclair Oil Corporation. Plans for the construction of a 10,000-ton capacity butadiene plant near Bristol, Penna., have been announced by the Publicker Commercial Alcohol Co., of Philadelphia.

Following through on its "streamlining" of the rubber program, WPB revoked preference ratings and halted construction on an addition and alteration to a "polly" gasoline unit of the Arkansas Fuel Oil Co., of Shreveport, La., which was to produce butadiene, on May 18. The project was halted when it was indicated that it could not be completed in time to be fully effective in the war effort. Estimated total cost of the work was $315,359.

From the styrene side of the picture comes the encouraging news that the plant operated by the Monsanto Chemical Co. at Texas City, Texas, is in full operation. Basic construction of this plant, according to information supplied by Monsanto, was begun on March 17, 1942, and the first tank car of styrene left the plant on March 10, 1943, just seven days short of one year. It was shipped to the copolymerization plant maintained in Akron by Goodyear.

Before the piling was driven, part of the plant site covering 13½ acres had to be filled in with sand pumped in from the bed of Galveston Bay. The following metals were required: 13,250 tons of steel and iron, 290 tons of copper and alloys, 260 tons of alloy steel, and 16 tons of nickel alloys. More than 2,600 construction tradesmen took an essential part in the building. The plant's major unit, the distillation tower, is equivalent in height to a 20-story office building. The water pumping unit is capable of pumping 35,000 gallons of water a minute. Fully 20% of the plant is underground.

Although Monsanto now secures its ethylene and benzol from outside sources, it is preparing to make its own ethylene at the Texas City plant. Ethylene is obtained through a cracking process from propane, a compound of crude petroleum.

In answer to an unprecedented request from WPB, the Brown Instrument Division of the Minneapolis-Honeywell Regulator Co., of Philadelphia, doubled its normal output of flow meters during April in order to speed expansion of both the synthetic rubber and 100-octane gasoline programs, the company has announced. These instruments control the rate of flow through the maze of piping required for the operation of such plants. Simplifications of dial pressure gauges and regulators by WPB, covered in Limitation Order L-272, is expected to raise production of these items, which are used in the rubber, shipbuilding, high octane and chemical warfare programs, from 15 to 25% and to expedite the "must" programs in which they are used.

Conversion to Synthetics

The problem of the conversion from crude to synthetic rubber is one which is currently occupying the direct attention of the Office of the Rubber Director. As supplies of synthetic rubber become more freely available, they will be allocated to replace crude rubber now being used. Such allocation will affect practically every branch of the industry and, unfortunately, the record indicates that too many rubber manufacturers, especially small manufacturers, have made no special effort to date to acquaint themselves with the properties and characteristics of the synthetics.

Stocks of crude rubber are declining rapidly and new imports—set at 74,000 for 1943 by Rubber Director Jeffers—will represent only a very small percentage of anticipated total rubber consumption. It therefore follows that from now on manufacturers will be forced to use less crude and more synthetic and that this trend will become more and more pronounced as the volume of synthetic production increases.

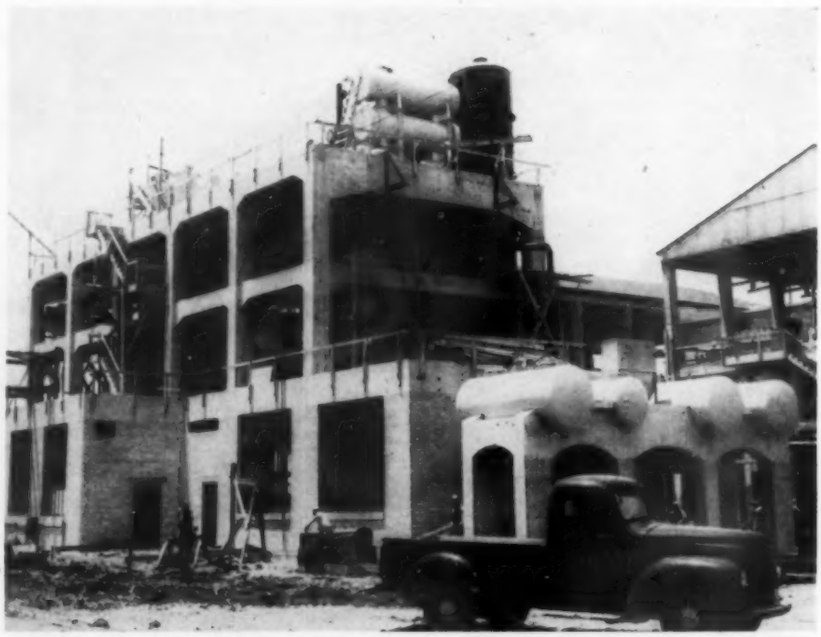
For example, manufacturers of rubber drug sundries have been authorized from time to time to consume crude rubber in the manufacture of certain products, such as finger cots, dilators, parts for medical instruments, tubes and tubing, etc. In the near future the use of crude rubber in the manufacture of such articles may be completely prohibited and only one of the available synthetics allowed. Manufacturers of such products, therefore, for their own protection, should begin to experiment with the synthetics just as quickly as possible.

Another example may be found in industrial rubberized (dipped canvas) gloves. The use of rubber latex in the manufacture of such gloves is currently authorized, but it may soon become necessary to allocate synthetic latex, probably Neoprene Latex Type 571 in this case, for such production. Although the industry in general is familiar with neoprene latex, there may be some manufacturers unfamiliar with it. Such manufacturers are urged to make application to the Office of the Rubber Director for allocations for experimental use.

Status of Carbon Black

Increased production of furnace type carbon black will meet both domestic and export requirements it was revealed at a recent meeting of the Carbon Black Manufacturers Industry Advisory Committee, held in Washington, D. C. The excellent cooperation of the industry during the past twelve months and the initial production of several new plants has re-

OPEN-WALL CONSTRUCTION FEATURES GOODYEAR'S HOUSTON, TEXAS, PLANT



The open-wall type of construction permitted by Texas' climate is shown graphically in the above reproduction of the building which will store completed latex, ready for final processing, in the 60,000-ton synthetic rubber plant near Houston which is being constructed by and will be operated by the Goodyear Tire & Rubber Co. This plant is scheduled to go into operation sometime in August.

sulted in greatly increased production of this type black, particularly required in the compounding of certain types of synthetic rubber products.

It was also revealed that creation of a carbon black hopper car pool was considered imperative by the Advisory Committee in order that maximum efficiency can be maintained with fewer cars of this type. A car pool, it was pointed out, would enable the industry to lease part of its fleet of cars to other essential industries whose products are not too heavy for this type of transportation.

Discussing the entire carbon black situation in the June 3 issue of the *Journal of Commerce*, Dr. I. Drogin, director of research for the United Carbon Co., points out that before the advent of synthetic rubber the production of furnace blacks was about 150,000,000 pounds a year. The demand for this black is now so great that manufacturing facilities have been increased to achieve an output of more than double that amount. There are now seven producers of furnace type black, with plants located in Texas, Oklahoma, Kansas, Louisiana, and California.

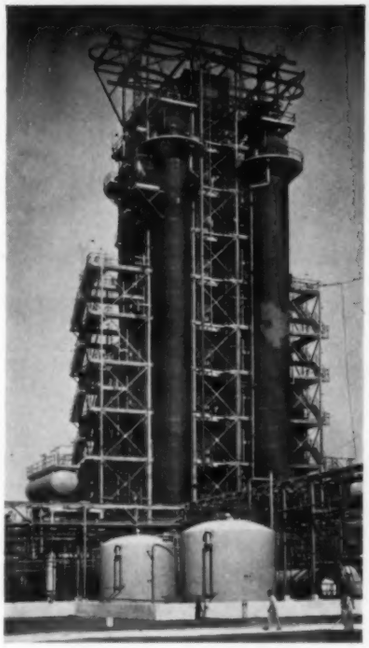
Dr. Drogin also indicates that whereas the recovery of channel black from natural gas averages about 1½ pounds per thousand cubic foot gas burnt, that of furnace type black ranges from 3 to 8 times as much, depending on the richness of the gas and the quality of the black desired. From the standpoint of conservation of natural gas resources, he says, this increase in yield and utilization of gas speaks well of the increased efficiency in the carbon black industry.

Carbon black requirements for the balance of this year, according to Dr. Drogin, will be in excess of 400,000,000 pounds. For next year, when the synthetic rubber production is estimated to be 750,000 tons, in addition to about 74,000 tons of new crude, he estimates the requirements for all types of carbon blacks to reach 800,000,000 pounds. The maximum consumption of carbon black for any one year in the past was 560,000,000 pounds.

Incidentally, a special committee headed by W. B. Wiegand, director of research for the Columbian Carbon Co., and now associated in a research capacity with the Office of the Rubber Director at Washington, has been considering standardized nomenclature for carbon black. This committee has had a few meetings and has submitted some recommendations, which will be acted on in the near future. It is generally agreed that standardized nomenclature will prove of considerable assistance in the publication of technical information.

New Set-Up on War Orders

According to Circular No. 21, issued on May 31, Rubber Reserve Co. will continue to sell crude rubber, guayule, balata and liquid latex for "civilian use" at the prices set forth in Exhibit A of Circular No. 17 (reproduced in full in our April, 1943, issue), and will sell GR-S (Buna S) at a price of 18½c per pound and GR-I (Butyl) at 15½c a pound for "civilian use," plus uniform freight



This is one of the distillation towers at the styrene plant at Texas City, Texas, operated by the Monsanto Chemical Co. The tower is equivalent in height to a 20-story building. The plant, which will cost $17,000,000 when completed, went into production seven days less than a year from the time basic construction was started.

charges in all cases. No price has been established for the sale of GR-M (neoprene) for "civilian use" as yet. This is the first time that any price has been set on GR-S or GR-I for "civilian use."

In addition, although no change has been made in the prices set in Exhibit A of Circular No. 17 with respect to "other than civilian uses," in view of the problems involved in the adjustment of "war orders" to reflect such prices, Rubber Reserve has established a special procedure for the payment of rubber used in such orders. The new procedure was adopted on June 1 with respect to sales of natural and synthetic rubber for use in the manufacture of end-products covered only by "war orders."

Under the new procedure, Rubber Reserve will accept payment from manufacturers at the prices set forth in Exhibit A of Circular No. 17 in the column designated "Civilian Use" and at the prices for GR-S and GR-I indicated above, plus uniform freight charges. With respect to rubber used after June 1 for "war orders", the War Department, Navy Department, Procurement Division of the Treasury Department, and the U. S. Maritime Commission will make payments direct to Rubber Reserve in the amount of 17½c per pound.

Rubber manufacturers must submit to Rubber Reserve monthly appropriate certificates (there are five such certificates covering various end uses) reflecting the amount of natural and synthetic rubber actually used in producing end-products under "war orders" for which the manufacturer rendered invoices during the month. The first such certificates shall cover the month of June and shall be sent to Rubber Reserve not later than July 20. Certificates for each subsequent month must be forwarded not later than the 20th day of the succeeding month. A method for determining poundage in each case has been devised by Rubber Reserve.

In the event a manufacturer uses no rubber during any given month in connection with "war order" end-products, one of the certificates must still be filed indicating such information. Records must be maintained by all manufacturers in support of information filed on any of the certificates.

All manufacturers should promptly submit to Rubber Reserve a list of all of its outstanding "war orders" in which the contract price is based upon costs for natural or synthetic rubber in excess of the prices for natural rubber set forth in Exhibit A of Circular No. 17 under the "civilian use" column or in excess of the new prices for GR-S and GR-I for "civilian use" indicated above. Manufacturers are expected to promptly take such steps as may be necessary to adjust the end-product prices specified in any of their "war orders" which fall into the aforegoing category.

Manufacturers who have previously purchased crude rubber, guayule, and liquid latex at the prices set forth in Exhibit A of Circular No. 17 in the "other than civilian use" column should immediately forward to Rubber Reserve a debit memorandum against Rubber Reserve in an amount equal to the difference between the prices actually paid and the prices set forth in the "civilian use" column of that Exhibit. Likewise, manufacturers who have previously purchased GR-S or GR-I at prices in accordance with the provisions of Circular No. 17 should forward debit memorandums in an amount equal to the difference between prices actually paid and the new prices set for these materials for "civilian use" for Rubber Reserve, *i.e.*, 18½c per pound for GR-S and 15½c a pound for GR-I. All such debit memoranda must schedule by purchase permit number the deliveries and amounts of the purchases in connection with which refund is requested.

Circular No. 21, which supersedes Circular No. 20, points out that deliveries of crude rubber, guayule, liquid latex and synthetic rubber will continue to be made in the manner prescribed in Circular No. 17 and that all requests for the issuance of purchase permits should be addressed to the Office of the Rubber Director as heretofore.

Definitions are Clarified

The term "war order" does not include any contract or purchase order for "maintenance, operating or repair material or equipment to be delivered to or for the account of any Federal Government-owned or controlled plant or facility

which is not operated by the Federal Government," according to Amendment 3 to Supplementary Order M-15-b, as Amended April 13, 1943, issued by WPB on June 3.

The words "maintenance, operating or repair" are inserted to qualify the words "material or equipment" to make it clear that the term "war order" does not include any contract or purchase order for material or equipment to be deliyered as specified, other than maintenance, operating or repair material or equipment.

The words "plant or facility" are substituted for the word "corporation" for the reason that it has been found that some Federal Government-owned or controlled plants or facilities—such as ordnance plants—are not incorporated, and it is desired to exclude deliveries to them or for their account whether they are incorporated or not.

Reduce Scrap Prices

A cut of $10 a ton in the price the Rubber Reserve Co. will pay for scrap tires and acceptable grades of miscellaneous scrap rubber was announced by Jesse Jones, head of the RFC, on May 25. Only $15 a ton will be paid for such scrap in the future. Miscellaneous inner tubes and tread buffings, however, will continue to be purchased for 6 cents a pound and $25 a ton, f.o.b. point of shipment, for the present.

WPB recently sent instructions to local salvage directors to discontinue the collection of general household scrap rubber. These instructions specified the type of rubber scrap which would continue to be purchased and suggested that householders be requested to continue to save their rubber scrap for possible collection in the future.

According to a recent statement attributed to Rubber Director Jeffers, the amount of scrap currently entering trade channels each month is almost equal to the monthly production of reclaimed rubber, believed to be about 28,000 tons. The lack of camelback for recapping reported by some localities was said to be due to faulty distribution rather than to lack of raw material.

CEILINGS SET FOR GOVERNMENT PURCHASES; OTHER INDUSTRY ORDERS

To permit unified handling of pricing problems in the sale of certain rubber commodities to the Government, OPA issued Maximum Price Regulation 403 (Certain Rubber Commodities Purchased for Governmental Use) on June 3. Maximum prices covered by the regulation were established formerly under one or another of four other regulations, *i.e.*, G.M.P.R., M.P.R. 157 (Sales and Fabrication of Textiles, Apparel and Related Articles for Military Purposes), M.P.R. 149 (Mechanical Rubber Goods), and M.P.R. 220 (Certain Rubber Commodities).

Establishing April, 1943, as the base date in order to provide for changed costs of synthetic rubber that recently became effective, the regulation gives the pricing method for manufacturers to apply to goods that are the same or similar as those sold or offered for sale in the base period, and also to goods that are different from those sold in the base period. Other sellers than manufacturers are to establish their maximum prices by applying mark-ups to their purchase prices for the commodities.

Upon application to it and filing of required information by the manufacturer or seller, OPA will approve prices for those commodities which cannot be priced under the specified methods. In these cases the commodities are exempt from price control for three months until the OPA establishes a maximum price, in order not to impede production and delivery of important war materials.

Also, for similar reasons, commodities sold under secret contract or developmental contracts are exempt from price control. However, following the end of such secret or developmental period for any commodity it becomes subject to maximum prices established under the regulation.

Commodities which are listed in the regulation are covered when made in whole or in part of rubber, and when sold pursuant to a war order. They are considered to be sold pursuant to a war order when delivered to or for the account of any agency of the United States Government; but *not* when delivered to or for any corporation owned or controlled by the Federal Government but *not* operated by it, or when sold for post exchanges, ship's stores, commissaries or similar purchasers. It also applies to sales made to contractors or subcontractors of goods which are to be physically incorporated into materials to be delivered to agencies of the United States Government.

Products Specifically Covered

Products covered by the new price regulation include:

(a) The following items of wearing apparel and findings: Canvas topped rubber footwear, including but not limited to climbing shoes, gym shoes, and jungle boots; clothing, rubber or coated fabrics, including but not limited to foul weather clothing, hat covers, ponchos, raincoats and rainsuits, slickers and waterproof capes, cloaks, gloves, hats, jackets, leggings, overalls, sleeves, and trousers; heels and soles; waterproof rubber footwear (except that covered by M.P.R. 132).

(b) The following personnel equipment: Blankets, bags, including but not limited to clothing, delousing, food, rifle, sleeping, and water sterilizing bags, diving suits and equipment, flying suits, gas and oxygen mask parts, jungle hammocks and jungle hammock covers, life belts, life preservers, life rafts, life saving suits, life vests, mattresses, parachute parts and equipment, parts of helmets, tents.

(c) The following miscellaneous items and parts: Airplane de-icers and de-icer hose, anti-vesicant or decontamination gloves, balloons for weather-radio observations, inflatable boats, bullet sealing hose, fairings for propellers, flotation bags and bladders, fuel tanks and cells, gas bags, inflation tubes, jettison tanks, landing boats, life-buoys, parts of hearing devices and radio head sets, pneumatic floats and valves, pontoons, solid and bogie wheels, tank treads, blocks and tracks, tarpaulins.

In keeping with the new pricing regulation on governmental sales, OPA issued Amendment 8 to M.P.R. 157 on June 4, this amendment removing coated fabrics, footwear and wearing apparel for military use made in whole or in part of rubber from that regulation. Articles containing natural, reclaimed, synthetic or substitute rubber, with the exception of coated fabrics, formerly covered in M.P.R. 157, are now covered by M.P.R. 403. Coated fabrics, however, are now subject to M.P.R. 220 (Certain Rubber Commodities).

RUBBER MACHINERY

Under the terms of General Limitation Order L-143-a, as Amended May 20, 1943 (Rubber Processing Machinery & Equipment), dealers may now acquire used machinery and equipment without specific authorization; machinery or equipment, except tire molds, may be reconditioned and rebuilt, providing the cost of materials does not exceed $350., without specific authorization; and alterations may be made in tire molds below the tread line, also without specific authorization.

In addition, calender shells, which are actually supply items, and hose mandrels have been dropped from the lists of machinery and equipment covered by the regulation, thus relieving the Office of the Rubber Director from the administrative burden of granting authorizations for such small items, while rag rollers and tubers have been added to the list of mechanical goods equipment.

Minor changes have also been made in the definitions of "rubber processing machinery or equipment" and of "delivery." The purpose of the change in the machinery definition is to indicate the applicability of the order in cases where rubber processing machinery is actually used in processing plastics or rubber substitutes. The change in the definition of delivery brings within the restrictions of the order any transfer of machinery requiring shipment outside the continental limits of the United States.

MECHANICAL GOODS

Reductions in manufacturers' and wholesalers' maximum prices for mechan-

ical rubber goods to reflect the lowered prices of synthetic rubber used in such products were established by OPA on June 3 with the issuance of Amendment 9 to M.P.R. 149 (Mechanical Rubber Goods). The new prices are effective June 17.

The amendment supersedes the General Maximum Price Regulation with regard to wholesalers' sales covered by the regulation. All wholesale sales of mechanical rubber goods are now covered by M.P.R. 149 except those of packings, gaskets, and automotive parts. Inclusion of wholesalers' maximum prices in the regulation was done to simplify the reduction of their prices in line with the reduction in manufacturers' prices.

Reduction of manufacturers' prices is made according to one or the other of two methods. In the case of commodities for which the manufacturer had a regularly quoted price on the base date, the former maximum price is decreased by an amount equal to the difference in cost between the synthetic rubber used in the commodity on June 1, 1943, and that used on the base date. The base date is October 1, 1941, with respect to commodities that are listed in Appendix A of the regulation, and January 5, 1942, with respect to commodities listed in Appendix B.

In the case of commodities for which the manufacturer did not have a regularly quoted price on the base date, the use of the June 1, 1943, price for synthetic rubber used in the article is to be used in computing the maximum price. In such cases the maximum price for deliveries of mechanical rubber goods containing synthetic rubber made after the effective date of this amendment must be recomputed in accordance with this provision.

Where the commodity dealt in by the manufacturer on the base date is the same except for the substitution of GR-S (Buna-S) or GR-I (Butyl), for natural rubber, there is no change in the maximum price.

Another change in the regulation made by the amendment is reduction of the differentials which may be added to the maximum price for hose made of natural rubber to determine the maximum price for hose made of neoprene. This also is based on the lowered price of the synthetic rubber.

Reductions in manufacturers' maximum prices of products covered by M.P.R. 220 (Certain Rubber Commodities) were accomplished at the same time by OPA with the issuance of Amendment 9 to that regulation. These reductions are effected in substantially the same way as are the reductions in maximum prices for manufacturers' prices of mechanical rubber goods detailed above.

May Secure Price Adjustments

Individual adjustments of ceiling prices of essential mechanical goods may be secured by essential producers in certain specified cases, according to the terms of Amendment 10 to M.P.R. 149, issued June 9 and effective June 15. An "essential producer" is one whose output of the commodity cannot reasonably be expected to be replaced at a price lower than the proposed adjusted maximum price or any manufacturer who has entered into, or proposes to enter into, a war contract or subcontract. An "essential mechanical rubber good" is one which contributes to the effective prosecution of the war.

An adjustment also may be granted to an essential producer of an essential mechanical rubber good in any case in which he agrees to make a reduction in the selling price of another commodity, or other commodities, which will equal or exceed the total dollar amount in terms of annual revenue of the adjustment granted. If such an adjustment is allowed, OPA will require appropriate reports relating to the commodities. No form is provided for these applications, but they must be filed in accordance with Revised Procedural Regulation No. 1.

Adjustments may be made by the national office of OPA, any regional office, or such offices as may be authorized by an order issued by the proper regional office. The application is to be filed with the national office where the manufacturer's sales during 1942 exceeded $500,000 and with the appropriate regional office where the manufacturer's sales during that year did not exceed $500,000.

Except where the manufacturer seeks an adjustment on the ground that he will lower the selling prices of other commodities, sales may be made at the requested price while the application is being considered. In such case the only restrictions imposed are that the manufacturer may not receive payment of any amount which exceeds the maximum price until the requested adjustment has been made, and that the manufacturer shall inform the person to whom he is selling of the maximum price, that an application has been filed and that the specific price quoted is subject to OPA approval.

BOOTS AND SHOES

Ration Order 6A, issued on June 1 by OPA, now supersedes Ration Order 6 covering men's rubber boots and rubber work shoes. Although the terms of the new ration order have been greatly simplified, the purpose of the regulation remains the same, *i.e.*, to ration the six types of industrial rubber footwear which can be made with a high crude rubber content, to workers who need them in essential jobs. However, where only miners and loggers were eligible for Type 5 footwear (rubber pacs and bootees more than 10 inches in height), miners, loggers, communications linemen, construction workers, oil drillers, quarry workers, and clay extractors are now eligible for this type.

Under the terms of the revised ration order a purchaser is no longer required to turn in any worn-out rubber footwear of the rationed types in his possession at the time he buys a new pair; a new ration certificate, the size of a bank check, takes the place of the three-part certificate formerly used; and purchasers of rationed footwear may return it to the seller for refund if it has not been worn, taking back his ration certificate.

Other changes provided by RO 6A include: (1) Trade reports and applications are now to be filed with OPA district offices; (2) Retailers are no longer required to keep detailed sales records; (3) Manufacturers are authorized to use ration certificates to acquire rationed footwear from other establishments; (4) Rubber footwear for testing purposes is now available to persons other than manufacturers; (5) One firm may acquire, without certificates, all of the rationed footwear from another firm that is disposing of either its entire rationed rubber footwear line or its entire assets.

On June 5, WPB clarified the authority to ration footwear which it delegated to OPA on February 8. The action was taken under an amendment to Supplementary Directive No. 1-T, which gives OPA broad control over the sale and distribution of footwear. The amendment makes it clear that the authority delegated to OPA to ration footwear includes shoes made in whole or in part of leather or containing any crude rubber, latex, reclaimed rubber, scrap rubber, or synthetic rubber in the sole.

DRUG SUNDRIES

Temporary manufacturers' ceiling prices for syringes, catheters, and similar drug sundries made of neoprene have been established by OPA in Amendment 7 to M.P.R. 300 (Maximum Manufacturers' Prices for Rubber Drug Sundries), issued on May 25. The new ceilings provided will expire on September 30, 1943, before which time OPA expects to revise and possibly lower some of the prices, most of which were set on the basis of estimates.

Ceilings for neoprene bulbs and bulb goods are set at differentials ranging from 5 to 15 cents over the ceilings for the same commodities made of natural rubber, while for glass molded surgical tubing, prices of neoprene articles are established in dollars and cents per dozen items.

In another action, OPA extended from June 1 to September 30, 1943, the period during which wholesale prices of rubber drug sundries, except Victory Line sundries, sold by dental, surgical and hospital supply houses, are excepted from control under M.P.R. 301 (Retail and Wholesale Prices for Rubber Drug Sundries). During this period such suppliers remain subject to G.M.P.R. The extension of time was granted in Amendment 6 to M.P.R. 301, effective May 25. It has no effect on retail prices.

RUBBER HEELS

Under the terms of Amendment 7 to M.P.R. 200 (Rubber Heels), producers of segment fiber heels were given until June 20 to complete tests in accordance with quality standards under which the

heels were to have been classified on May 20. Until the new deadline, the heels continue to be classified and priced in relation to the minimum physical specifications of their non-fiber portion.

In the same amendment, issued by OPA on May 20, the distinction between corded and fiber heels is clarified. It is now specified that corded heels must contain clearly discernible whole cords which lie parallel to each other at a given level. It is also specified that only the fiber portion of fiber heels must meet the abrasion test.

MISCELLANEOUS ORDERS

Producers using rubber in the manufacture of machines or machinery parts for government use have been provided by OPA with an adjustable pricing provision which permits them to quote higher than ceiling prices to reflect cost increases resulting from the increased cost of crude rubber. The action was contained in Amendment 89 to M.P.R. 136 (Machinery and Transportation Equipment).

Four phosphate plasticizers are now under complete allocation, these being tricresyl, triphenyl, di-phenyl mono-(ortho xenyl), and di-(ortho xenyl) monophenyl phosphates. The first two were formerly under allocation while the latter two were added under the terms of Allocation Order M-183, as Amended May 24, 1943.

Cents-per-pound maximum prices for linseed oil, representing a rollback of three-tenths of a cent under going prices, were established by OPA in May with the issuance of Amendment 33 to R.P.S. 53 (Linseed Oil).

GOLDENROD PLAYING ROLE IN CURRENT EMERGENCY RUBBER PROGRAM

That goldenrod, in which the late Thomas A. Edison put a great deal of faith as a rubber-producing plant, is playing a role in the 1943 emergency rubber program was revealed in a report made by the Department of Agriculture on May 29 to the effect that experimental plantings of four selected strains of goldenrod totalling 650 acres have been completed this spring.

Under the program authorized by Rubber Director Jeffers, the Forest Service of the Department has planted selected strains of goldenrod on about 550 acres in the vicinity of Waynesboro in Burke County, Georgia. Small experimental plots of 2 to 10 acres were planted by the Bureau of Plant Industry in South Carolina, Alabama, Mississippi, Louisiana, Texas, and California.

Threefold purpose of the planting program is to determine the best locations, soil types, and methods of growing rubber-producing goldenrod; to obtain more complete information on possible yields; and to harvest a supply of goldenrod for testing extraction methods, as well as the properties and uses of the rubber product.

Requires No Nurseries

Goldenrod, it was pointed out in the report, does not require the use of nurseries for propagation. It may be planted directly in the field in the spring and harvested in the fall. Contracts have been signed with farmers for preparing the fields and cultivating the crops. Special agricultural machinery, developed by the Bureau of Plant Industry for goldenrod production, is being tested on a large scale.

Only the leaves of the plant are used in processing for rubber. They may be processed immediately or stored for processing later. This year's leaf harvest will be sent to the Department's Southern Regional Research Laboratory at New Orleans for further extraction and utilization studies. In the present experimental growing operations, every effort will be made to produce a maximum quantity of planting stock, in case a larger program should prove desirable in 1944.

Administration of the field project has been assigned to the Forest Service and is under the direction of Regional Forester J. C. Kircher with headquarters at Atlanta, Georgia. Research phases of the project are handled by the Agricultural Research Administration.

Kok-Saghyz Experiments

Experiments in growing *kok-saghyz* are being conducted this year on the Klamath project, in the Oregon-California area, of the Bureau of Reclamation, according to a statement by Secretary of the Interior Ickes on May 21. The Forest Service of the Department of Agriculture is now using about 20 acres of government-owned land on the project for cultivation of the Russian plant. A 5-acre tract on the adjacent experimental farm has also been seeded, while an additional 35 acres has been leased from farmers of the Lower Klamath Drainage District.

The main objective of this year's planting of *kok-saghyz* is to secure seed, although a small portion of the crop may be harvested and subjected to experimental processing for the extraction of rubber. The experiment on the Klamath development is a continuation of tests started in this country last summer with a shipment of seed received direct from Russia by plane. The Soviet Union is reported to have planted about 2,000,000 acres of *kok-saghyz* for rubber in 1942.

Last year a trial plot of about 2,000 square feet of Russian dandelion on the Experimental Farm of the Klamath project produced at the rate of 50 pounds of rubber per acre. The advantage of this plant over other rubber-producing plants is that it can be harvested and processed in a single year. The Russian plant is similar to the American variety except its rubber content, found in the tubes of the roots, has been increased through breeding and selection. It is less hardy than the American variety, requiring intensive culture.

Latin-American Developments

The news of rubber-producing activities in Latin America this month centers on Brazil and Peru. In Brazil, it is reported, thousands of prospective rubber tappers are being delayed at Belem due to a serious shortage of shipping facilities. Goods intended for the use of tappers now in the rubber-producing areas are straining the capacity of warehouses for the same reason. A fleet of small river boats, supplied by the United States, is awaited, while Brazilian authorities are trying to buy some ships from Argentina. In a move to stimulate the production of rubber, the government has exempted all rubber workers from army mobilization for the present.

A huge caravan is expected to leave Rio de Janeiro for Matto Grosso in the next several weeks. This caravan, headed by Col. Flaviano Vanique, will set up camps and establish settlers in the Matto Grosso region. Included in the program planned for the region is a careful combing of the jungle for rubber trees. Although uncharted as far as rubber is concerned, Matto Grosso is believed to be a vast reservoir of rubber and may yield thousands of needed tons. The first job of the caravan will be to gather rubber.

According to John C. McClintock, Assistant Coordinator of Inter-American Affairs, who recently returned to Washington from a trip to Brazil, engineers in that country are performing a unique war-time railroad rehabilitation job. By using long-abandoned rolling stock and making repairs despite limited shop facilities, these engineers are putting the celebrated Madeira-Mamore Railway in shape to haul rubber from the upper Amazon area for shipment downstream. This railway was built at a great cost in human toil and life at the height of the first great rubber boom in Brazil. It was completed in 1913, too late to be of much value then for the upper Amazon trade. The railway, which is 228 miles long, now boasts 10 locomotives, with three additional ones undergoing repairs.

Peru Reports Progress

In Peru, encouraging reports of production possibilities from the rubber-producing region around the Madre de Dios River, in the southeastern part of the country, have been made. Scouts have reported that thousands of rubber trees of a type known as "Shiringa" are located in the area, which has not heretofore been exploited due to lack of communications. "Shiringa" is said to be a local name in Peru and western Brazil for the Castilla ulei, a rubber-bearing tree akin to Castilla elastico of Central America and Mexico.

TIRE MAINTENANCE AND CONSERVATION STILL CONSIDERED ESSENTIAL

That war workers face a crisis in their automobile transportation before the end of the current year due to tire wear, making essential the continuation and strengthening of conservation measures, is the conclusion of a survey conducted by the Public Roads Administration of the Federal Works Agency and the Highway Traffic Advisory Committee of the War Department, the results of which were announced on May 25. Estimates made by owners of about 55,000 cars were analyzed in the survey.

The estimates were reported to indicate that by the end of 1943 almost 50% of the tires now on the vehicles of those submitting estimates will have worn out under normal conditions of use, 18% before July 1 and 32% in the latter half of the year. Approximately 55% of the tires owned at the time of the survey will fail before 7,000 additional miles have been driven, and nearly 80% before 14,000 miles. The average worker reporting was driving at a rate of 6,400 miles per year for necessary purposes, most of them using their cars for getting to and from work.

The data showed that 12% of the cars reported on had only four tires available and that in the case of approximately half of the vehicles for which five tires were owned the additional tire had 4,000 miles or less of service remaining. More than 18% of the spare tires owned were already at or beyond the recapping stage when the survey was made. An additional 34% could not be driven over 2,000 miles without requiring recapping.

Tire Quotas for June

Tire quotas for June, announced by OPA on May 27, are little changed from May. The quota of Grade III passenger car tires shows the greatest change, the total of district quotas for June amounting to 690,000 against 600,799 for May. The quota of Grade I tires is 1,012,000 for June, compared with 1,006,882 in May.

June truck tire quotas total 414,066 against 414,108 for May, while passenger car tube quotas are 828,000 for June against 735,781 in May, and for trucks 338,606 against 434,355 in the previous month.

Grade I tires (new passenger car tires) are used for needed replacements on cars with a monthly mileage ration exceeding 240, and Grade III tires (used or recapped casings) for replacements on cars with a mileage ration of 240 a month or less. In any case, applicants must show that the tires they have now are unfit for recapping.

Tire Bill Reintroduced

On May 20, Senator Allen J. Ellender (La.), acting for the Senate Committee on Small Business, reintroduced in the Senate the rubber tire bill. The measure, which is an amended version of S. 2560, presented during the last Congress, is now labeled S. 1122. It contains a provision which, if enacted as written, is intended to eliminate completely as a competitive factor the manufacturer in the retail field, while allowing mail order retail outlets to continue the sale of tires.

That part of the bill designed to bar manufacturers from the retail tire trade provides that "all new, rebuilt, retreaded, and recapped tires, all casings and tubes, and all camelback and other material for rebuilding, retreading, or recapping tires, sold or delivered in the course of trade or business to consumers (except governmental agencies) shall be sold or delivered only by or through independent tire dealers." An independent tire dealer excludes "any person who directly or indirectly owns or controls 10% or more of the voting stock of any other corporation which is engaged in manufacturing tires."

Spokesmen for Goodyear and Goodrich appeared before the special committee on May 13 to protest vigorously against the enactment of the proposed measure. The Goodyear spokesman denied that the tire dealers were in a "distressed" condition, while the Goodrich spokesman stated that the company stores operated by that company were established to supplement dealer distribution, not to replace it.

The new bill has been referred to the Senate Committee on Banking and Currency, which is expected to take it up promptly for hearings.

New Recapping Ceilings

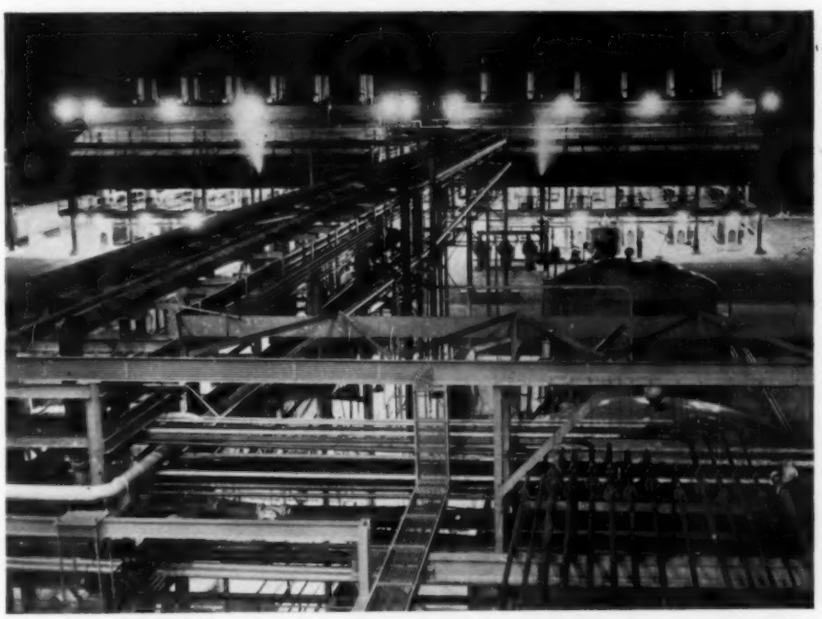
Maximum prices for recapping all sizes of farm tractor tires with Grade F camelback and for recapping truck and bus tires, size 8.25-20 and larger, with Grade A camelback have been established in Amendment 2 to R.P.S. 66, as Amended (Retreaded and Recapped Rubber Tires). The amendment was issued on June 1 and became effective June 7. The new prices reflect changes in the use of grades of recapping material ordered by WPB, resulting in slightly lower ceilings for recapping farm tractor tires and slightly higher ceilings for recapping bus and truck tires.

The new maximum prices replace those formerly listed in the price schedule. Under WPB direction, Grade C camelback may no longer be sold for use on farm tractor tires, and only Grade F may be used. Therefore, the new ceilings on such tires are lower, reflecting the reduction of direct material cost in the camelback, Grade F being made entirely of reclaimed rubber. Because Grade A camelback gives substantially more mileage and will therefore conserve rubber more effectively, its use for the recapping of large sizes of truck and bus tires was recently authorized by WPB.

Reusable Tire Carcasses

In order to obtain additional mileage from scrap tires that can be made serviceable with the addition of reliners, WPB has ordered that reusable tire carcasses be excluded from rubber scrap

MONSANTO'S STYRENE PLANT IN TEXAS RAPIDLY NEARS COMPLETION



The maze of pipes seen above form the processing service lines for the production of styrene at the Government plant in Texas City, Texas. The plant, which will soon be producing a substantial part of all the styrene to be used in the overall synthetic rubber program, was designed, built and is being operated by the Monsanto Chemical Co.

now being processed by reclaiming plants. It is believed that approximately 500,000 otherwise unusable tires can be placed in service through the Defense Supplies Corp. as a result of this order. The production of reliners for the purpose has also been authorized. These authorizations are contained in Amendment 2 to Supplementary Order M-15-b, as Amended April 13, 1943.

On June 8, WPB amended the above order to authorize the withholding of scrap tires that can be made reusable by the application of patches and other repair materials, in addition to the use of reliners. This latter regulation—Amendment 4 to Supplementary Order M-15-b—followed after investigation indicated that these potentially reusable carcasses, known to the trade as "twilight tires," amounted to many thousands of tires.

Amendments to Ration Order

Six additional amendments to Ration Order 1A (Tires, Tubes, Recapping and Camelback) have been issued by OPA since our last issue, as follows:

Amendment No. 28, issued and effective May 20, removes all rationing restrictions on the sale of used passenger car and truck inner tubes. Previously, used tubes could be sold only to holders of rationing certificates.

Amendment No. 29, issued and effective May 20, provides a plan for getting diminishing supplies of tires in trade channels down to the dealer level as quickly as possible by enabling dealers to get special permission to order larger supplies than they can "pay for" immediately with the replenishment portions (Part B) of rationing certificates they have on hand. The certificates will be turned in later.

Amendment No. 30, issued and effective May 27, states that application for authority to make a transfer under Section 1315.804 (j) (3) shall be made by the transferor and shall state the names and addresses of the transferor and the transferee and the number, type and grade of tires or tubes to be transferred.

Amendment No. 31, issued June 3 and effective June 9, provides for the filing of single applications for rationing certificates by operators of fleets of commercial and non-highway vehicles covering their aggregate needs. Such applications can be filed only when all the vehicles for which tires are being sought are owned and operated by the same person and used for the same purpose and are principally garaged or stationed at the same place.

Amendment No. 32, issued June 7 and effective June 12, permits farmers needing farm implement or front-wheel tractor tires to purchase suitable substitutes when they are unable to find a dealer with tires designed expressly for their purpose. It also grants permission for dealers to sell tires and tubes of a slightly different size than is called for by the rationing certificate to passenger car owners.

Amendment No. 33, issued June 7 and effective June 12, eliminates some of the inventory reports and records formerly required of members of the tire trade and commercial fleet operators. In addition, the frequency of some other reports still required are reduced.

Other Tire Regulations

New rubber tires and tubes made of Buna S for original equipment, when sold to the Government pursuant to war orders, were exempted from price control until July 1 by Amendment 3 to M.P.R. 119 (Original Equipment Tires and Tubes), issued by OPA on May 29.

Maximum retail prices were set for brands of passenger car and truck tires and tubes of four domestic distributors not previously listed separately in Amendment 11 to R.P.S. 63 (Retail Prices for New Tires and Tubes), issued by OPA on June 5, while several sizes of brands are given specific prices for the first time. The same amendment authorizes the OPA Territorial Director of Hawaii to decide whether retail dealers in that territory may add any part of the 16% allowed for dealer tire return pooling charges in the United States to their maximum prices for tires and tubes which were not actually returned under the Dealer Tire Return Plan.

Two amendments to Temporary M.P.R. 31 (Federal Government Purchases of New Tires and Tubes) have been issued. The first, issued May 17, sets the maximum price for 6.50-20 tubes at $1.44, while the second, issued May 26, exempts the Rubber Development Corporation from the terms of the regulation.

Amendment 6 to ODT No. 21, issued on June 2, allows operators of commercial motor vehicles a maximum period of 5,000 miles or six months, whichever occurs first, between tire inspections. Previously, such vehicles had to have inspections every 5,000 miles or every 60 days, whichever occurred first.

Fleet operators of commercial vehicles were exempted from the provisions of General Order ODT No. 21, which require that tire records be kept on back of the operator's Certificate of War Necessity, by the issuance of Exemption Order ODT 21-3A on May 17. The records, however, must be maintained elsewhere.

Rubber-Like Materials

A number of so-called synthetic rubbers and rubber-like materials have appeared on the market in recent months to somewhat take up the slack in crude rubber supplies. Many of these materials have valuable properties and are finding successful application as rubber substitutes or replacements. Some of them have excellent extending properties for GR-S (Buna S). It may safely be presumed that many more rubber-like materials are now in the process of development. Inventors and manufacturers of these materials, most of which eventually fall under allocation regulations, will do themselves a world of good by calling the attention of the Office of the Rubber Director to such materials as early as possible. They will also find they will receive some excellent cooperation on subsequent development and application from this Office, which has established a special department to handle rubber-like materials. It is therefore suggested that all inventors and manufacturers of new rubber-like materials, present or prospective, communicate with Mr. J. E. Hutchman, Office of the Rubber Director, New Municipal Building, Washington, D. C.

Additional "E" Awards Made

Included among companies receiving the Army-Navy "E" award in recent weeks for production efficiency were the following:

American Cyanamid Co., Linden, N. J.

Callaway Mills, Hillside Plant, La Grange, Georgia.

Goodyear Aircraft Corp., Litchfield Park, Arizona.

Magnetic Pigment Co., Trenton, N. J.

Resinous Products & Chemical Co., Philadelphia, Penna.

U. S. Rubber Co., Eau Claire Ordnance Plant, Eau Claire, Wisconsin.

U. S. Rubber Co., Shelbyville, Tenn.

In addition to the above, white starred flags, symbolic of renewal of the "E" burgee, have been awarded to the Perth Amboy, N. J., and Rome, N. Y., plants of the General Cable Corp.; a second renewal of the award has been bestowed on the Detroit, Mich., and Elizabeth, N. J., plants of Reichhold Chemicals, Inc.; a silver merit medal has been given to the B. F. Goodrich Co. by the War Production Board in the Los Angeles, Calif., area; and an "M" pennant has been presented to General Cable by the Maritime Commission.

New Tack-Producing Plasticizer

Estac, a new tack-producing plasticizer for GR-S (Buna S) rubber has been developed by the Norris Manufacturing Co., Paterson, N. J. The new material is a light brown, soft solid, with a specific gravity of 1.08 at 25° C., and has a mild but pleasant odor. Tackiness imparted to stocks by Estac is retained for a considerable length of time and if such stocks need freshening after a period of storage this can be accomplished by wiping the surface with a little gasoline. In other words, according to the manufacturer, no glazing or surface oxidation is encountered under suitable storage conditions. Although primarily designed for use with GR-S, Estac can also be used to advantage in other synthetic rubbers, including Hycar and neoprene.

AKRON RUBBER WORKERS PROTEST WAGE DECISION

Some 50,000 workers in the Akron plants of Goodyear, Goodrich and Firestone walked out on May 22 in protest against the wage award handed down by the War Labor Board. Although an increase of 8 cents an hour, retroactive to June of last year, was recommended by a special panel appointed by WLB to hear the issues, the parent board voted an increase of only 3 cents an hour.

The walkouts occurred shortly after the WLB's decision was announced. Workers at the General Tire plant, who have a similar petition pending before the board, walked out in sympathy, but returned to work the following day.

Union officials, in general, condemned the strike and ordered the workers to return to the plant, pointing out that the work stoppage was in violation of the mandates adopted by the U.R.W.A.'s last convention as well as a violation of the union's no-strike pledge to the President. They declared, however, that the walkout was a "spontaneous demonstration" against the decision of the labor board which, they said, failed to meet the "Little Steel" formula. The board, however, in announcing its decision, stated that the increase of 3 cents an hour would stabilize pay levels throughout the industry under this formula. Although 8 plants of the U. S. Rubber Co. were affected by the decision, no walkout or disturbances were reported at any of these plants.

In clarifying its position on the decision, the labor board declared that the panel which studied the cases, which began last June, failed to consider the Akron plants in relation to wage stabilization in the industry as a whole. It held that an increase of 8 cents an hour, as recommended by the panel, would give Akron workers a larger increase than they were entitled to under the "Little Steel" formula, which provides a cost of living adjustment of 15% over rates prevailing on or about January 1, 1941.

Considering the wage structure of the industry as a whole, according to the board, the 3-cent raise brought wages up to and in some cases above the 15% margin. Prior to the granting of the 3-cent increase, the straight-time hourly earnings of all employees in the Akron plants averaged between $1.15 and $1.20, which, the board declared, exceeded the average non-rubber rates in the Akron area.

Starting at the Goodrich plant, the strike quickly spread to the Goodyear and Firestone factories. Brief violence was reported at the gates of the largest Goodyear plant on the second and third days of the strike, but nothing to equal the fighting which marked the five-week Goodyear strike held several years ago. Production stopped almost completely at the Goodyear, Goodrich and Firestone plants, despite telegrams of protest sent to union leaders by Army officials. WLB members advised a union delegation that the board would accept an appeal to reconsider the wage decision, but refused to act on any such appeal while the workers were absent from their jobs.

On May 26, four days after the strike started, President Roosevelt took a hand in the situation. In a sharply-worded telegram sent to Sherman H. Dalrymple, U.R.W.A. president, and presidents of the Goodrich, Goodyear and Firestone locals, he warned the strikers to get back to their jobs or "your government will take the necessary steps to protect the interests of the nation." He termed the strike "a flagrant violation of the no-strike pledge" and pointed out that "the War Labor Board has already called your attention to the fact that orderly procedures exist for a review of your grievances." As commander-in-chief of the Army and Navy he directed "all picketing to cease and all employees now out on strike at the rubber plants to return to work at once."

A back-to-work movement was actually in effect by the time the President's message was received. The message, however, had the desired effect, and resulted in the end of the walkouts. By Monday, May 31, practically all shifts were resumed at the plants affected. The War Labor Board now has an appeal under advisement and is expected to render a further decision within a month or two.

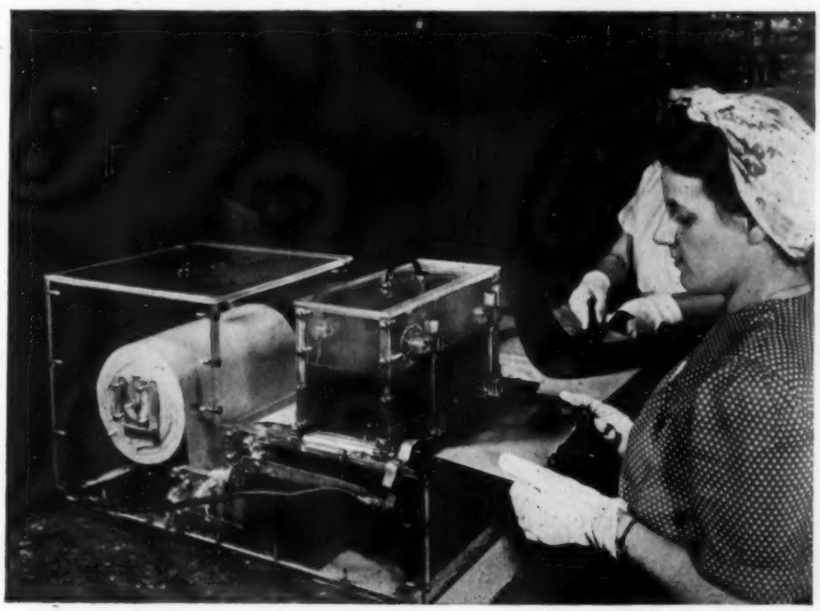
Writes on Synthetic Rubber

An excellent survey of the past, present and future of synthetic rubber, written by Dr. Harry L. Fisher, director of organic research of U. S. Industrial Chemicals, Inc., Stamford, Conn., appears under the title of "Synthetic Rubber" in the May 25, 1943, issue of *Chemical & Engineering News*, official organ of the American Chemical Society. The article is based on a recent talk given by the author before the Junior Chemical Engineers of New York City. Dr. Fisher is currently associated with the Office of the Rubber Director at Washington, D. C., where he spends most of his weekdays.

Thiodor No. 1

Thiodor No. 1, a deodorant specifically developed for use in connection with Thiokol N, especially when the latter is used in the manufacture of camelback, has been announced by Givaudan-Delawanna, Inc., New York City. Tests indicate that when the new deodorant is added to the batch on the mill the strong odor of the Thiokol subsides and is replaced by the faint pleasant odor of the deodorant which persists throughout the milling operation. It was found necessary, however, to use the deodorant in a minimum concentration of 3% based on the weight of Thiokol N.

NEW DUPONT ADHESIVE REPLACES RUBBER IN SPECIAL APPLICATIONS



A new adhesive which will replace hundreds of thousands of pounds of crude rubber has been developed by the Plastics Department of E. I. du Pont de Nemours & Co., Inc. In the above reproduction, the new adhesive is being applied to masking paper which protects the highly polished surfaces of methyl methacrylate resin during shipping, handling and fabrication. In the machine seen, paper is coated for use on narrow sections of the plastic. Larger machines are used to coat masking paper for noses, gun turrets and other big sections of military aircraft.

SYMPOSIUMS WILL FEATURE NEW LABORATORY DEDICATION

The new research laboratory of the Goodyear Tire & Rubber Co., which represents a cost of $1,325,000 and which incorporates some of the most modern equipment for rubber and plastics, will be formally dedicated in Akron on June 21, 22 and 23. A two-day scientific program—on June 22 and 23—will be the keynote of the dedication. This program will feature four symposiums, on the subjects of synthetic rubber, plastics in war and peace, the future of chemistry, and the future of transportation.

Synthetic rubber will be discussed on the morning of June 22 by Dr. P. K. Frolich, director, chemical division, Esso Laboratories, Standard Oil Development Corp.; Dr. N. H. Shepard, chemical director of the American Cyanamid Corp., now heading up research activities for the Office of the Rubber Director in Washington; and Dr. L. B. Sebrell, manager of research for Goodyear and recently honored as the Second Goodyear Lecturer. Following this session, Dr. R. P. Dinsmore, manager of Goodyear's research and development department, and until recently an Assistant Deputy Rubber Director, will speak on the Government program on synthetic rubber at a luncheon to be held.

Plastics will be discussed in the afternoon by Dr. T. S. Carswell, research director, Plastics Division, Monsanto Chemical Co.; Dr. A. M. Howald, Plaskon Division, Libbey-Owens-Ford Glass Co.; and Dr. D. S. Frederick, sales manager, Plastics Division, Rohm & Haas Co.

The future of chemistry will be the subject of the session on the morning of June 23. It will be handled by Dr. Leland I. Doan, vice-president, Dow Chemical Co.; Dr. E. R. Weidlein, director, Mellon Institute; and Dr. G. P. Hoff, technical director, Nylon Division, E. I. du Pont de Nemours & Co. The future of transportation will be discussed that afternoon by Dr. A. B. Culbertson, of the Shell Oil Co.; Dr. Jerome Hunsaker, of M.I.T., who is also chairman of the National Advisory Council on Aeronautics; and P. W. Litchfield, Goodyear chairman of the board.

At the luncheon to be held on June 23, Dr. Harry N. Holmes, professor of chemistry at Oberlin College and past president of the American Chemical Society, will speak on the importance of university and college laboratories for the future of industry. The dedication will close with a dinner that night.

(EDITOR'S NOTE: A complete description of the new research laboratory will appear in our next issue.)

Conductive rubber containers, used to handle explosives in munitions plants without danger of either static or mechanical sparks, are now being produced of synthetic rubber by the U. S. Rubber Co.

Cotton Woven Soles

Bigelow-Sanford Carpet Co. has developed a synthetic outer sole for shoes which it believes will give 50% more wear than grade A leather and from 100 to 200% more than lower leather grades. The soles are made entirely of tightly woven cotton, treated chemically under pressure with a synthetic resin to increase resistance to abrasion, heat and moisture. The company intends to do all of the weaving on its special Lokweave looms and some of the processing as well. Other steps in processing will be handled by other plants.

Anaconda Officials Fined

In a surprise move, the Marion, Indiana, plant of the Anaconda Wire & Cable Co., and five of its officials and employees, all charged with conspiracy to defraud the government through the sale of defective communications wire, entered pleas of nolo contendere on June 7 in the Federal Court at South Bend, Indiana. After hearing arguments for convictions presented by Government counsel, Judge Thomas W. Slick ended the case by imposing fines and prison sentences, the latter to be suspended on payment of the fines.

Anaconda was fined $10,000, the maximum, and costs, while maximum fines were also levied against Thor S. Johnson, general manager of all of the company's plants, and Frank E. Hart, manager of the Marion plant. Chalmer C. Bishop, chief inspector at the plant, and Don R. Carpenter, former plant superintendent, were each fined $500, and Frank Kunkle, former assistant chief inspector, was fined $100. Mr. Johnson received a two-year prison sentence, Mr. Hart one of 18 months, and Mr. Bishop a year and a day, these sentences to be suspended on payment of the fines.

In announcing the penalties, Judge Slick said that Messrs. Johnson and Hart "could better serve the war effort by going back to work" and that he believed the case "would stop anything of a similar nature elsewhere." Similar charges are pending against Anaconda's Pawtucket, R. I., plant.

Present "E" Award to Royle

The Army-Navy "E" Production Award was officially presented to the firm of John Royle & Sons at Paterson, N. J., on May 26. The award, for excellence in the production of war equipment, was made by Lt.-Col. Walter B. Brown, of the Army Signal Corps, and was accepted for the company by Clifford H. Ramsey, president. The presentation of "E" pins was made by Lt. Commander J. D. Gessford, of the Office of Inspector of Naval Material, and accepted for the employees by Charles J. Vollmer, superintendent.

RUBBER-PLASTICS GROUP TO MEET IN LOS ANGELES

The Rubber and Plastics Group of the American Society of Mechanical Engineers will hold a joint session with the Aviation Division during the meeting of the parent society to be held in Los Angeles this month. The joint session will be held at the Hotel Biltmore on June 17. John Delmonte, technical director of the Plastics Industries Technical Institute, is in charge of arrangements for the Group.

Four papers will be presented at the joint session, as follows: *Physical Properties of a Structural Plastic Material,* by C. W. Armstrong, Lockheed Aircraft Corp.; *Thermoelastic Forming,* by W. I. Beach, North American Aviation, Inc.; *Protection of Aircraft Instruments and Delicate Apparatus Against Vibration and Shock by the Use of Rubber,* by P. C. Roche, Lord Manufacturing Co.; *Wood-Cloth and Wood-Paper Laminates,* by John Delmonte.

A call for interesting papers for the meeting of the Rubber and Plastics Group to be held next December in conjunction with the regular meeting of the parent society has been issued by Dr. G. M. Kline, of the National Bureau of Standards, Washington, D. C., chairman of the group. Titles of the papers and names and addresses of the authors should be sent to Dr. Kline as soon as possible.

RUBBER DIVISION, A.C.S., WILL MEET IN NEW YORK

Although the next meeting of the American Chemical Society will be held in Pittsburgh, Penna., on Sept. 6 to 10, the executive committee of the Division of Rubber Chemistry has decided to hold its meeting in New York City. Although no date has yet been set for this Division meeting, it will probably be held the first or second week in October.

A special committee has been organized by John T. Blake, of the Simplex Wire & Cable Co., chairman of the Division, to handle arrangements for the New York meeting. This committee is headed by E. B. Curtis (Vanderbilt) as chairman, and includes John Ingmanson (Bell Telephone Labs.), Charles Haynes (Binney & Smith), Harry Outcault (N. J. Zinc), Walter Geldard (Naugatuck), B. B. Wilson *(India Rubber World),* and Peter P. Pinto (RUBBER AGE).

Acquires Brake Lining Co.

L. J. Miley Co., Inc., Chicago, manufacturers of brake linings, brake shoes and brake products in general, has acquired the machinery, equipment, good will and materials of the Hoosier Brake Lining Co., of North Manchester, Ind. According to E. G. Jacobs, general manager of the Miley company, the capacity of the North Manchester plant, which will be operated by the L. J. Miley Co. of Indiana, Inc., is being considerably augmented.

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INTERESTING PAPERS FEATURE MEETING OF NEW YORK GROUP

Three timely and interesting papers, one on Kem-Pol, the second on Butyl Rubber, and the third on flex-cracking characteristics of Buna S, featured the meeting of the New York Group, Rubber Division, A.C.S., held at the Building Trades Club in New York City on June 11, which took the place of the usual summer outing. In addition, some excellent entertainment was furnished after dinner. Approximately 300 members and guests attended the meeting, held at 4:30 P.M. in the afternoon as usual, while some 225 remained for dinner. John Ingmanson, of the Bell Telephone Laboratories, chairman of the group, presided.

Walton Discusses Kem-Pols

Under the title of "Kem-Pol", W. T. Walton, research chemist of the Sherwin-Williams Co. in charge of Kem-Pol production, described the properties, characteristics and applications of that new rubber-like material both as a replacement for rubber and as an extender for natural and synthetic stocks. Stressing the point that the Kem-Pols should neither be confused with the synthetic rubbers or the so-called chemurgic rubbers, such as Norepol or Agripol, although it resembles the latter in some of its characteristics, the speaker described four different types of Kem-Pol, each of which has special properties in its favor.

The preparation of the Kem-Pols prior to milling and recommended methods of milling, compounding and vulcanizing them were outlined by Mr. Walton who revealed that the Chicago plant of Sherwin-Williams has been manufacturing these materials in substantial quantity for several months. Mr. Walton also showed numerous slides depicting the results of tests on the effect of the Kem-Pols in various compounds. He also exhibited several dozen samples of finished products. (EDITOR'S NOTE: Mr. Walton's paper is reproduced elsewhere in this issue.)

Butyl Situation Outlined

The second speaker was I. E. Lightbown, of Stanco Distributors, Inc., who discussed "The Present GR-I (Butyl) Rubber Situation." He first traced the development of Butyl Rubber, newest of the synthetic rubbers, in a whimsical fashion, from its "infancy" to its "manhood," and then launched into a technical discussion of its quality, methods of mixing and processing, calendering, extruding, compounding, and incorporation of pigments, in the latter instance citing those materials which should and should not be used.

Included among the pertinent points made by Mr. Lightbown were the following: Butyl should preferably be mixed in a Banbury and since it requires no breakdown but otherwise handles like rubber in the Banbury it should be possible to use an even shorter cycle for mixing than is used for natural rubber; if an open mill is used for Butyl, handling will be facilitated if an apron mill is employed; it is advisable to have a reasonably close mill setting and to keep the rolling bank small by making "cutouts" at the ends of the rolls; uncompounded Butyl is tender at milling temperatures, but it is given strength by the proper incorporation of pigments.

Other comments included: Butyl Rubber adheres to cooler rolls, so in frictioning the middle roll of the calender should be somewhat cooler than the top roll; for skim-coating, the temperature of all rolls should be about 180°F. and for sheeting a few degrees hotter; in extruding Butyl, the die and head should be hot; the special factor to be watched in compounding is never to use a softener or an organic compounding ingredient which contains aliphatic unsaturation or, to put it another way, always use softeners with low iodine number; Butyl Rubber containing carbon black is much more abrasion resistant than pure gum Butyl, and is also tougher, more tear resistant, of higher modulus, and better resists cutting. Mr. Lightbown showed a number of slides on the aging, tack, effect of softeners, and vulcanization of Butyl.

Breckley Final Speaker

Joseph Breckley, technical sales representative of the Titanium Pigment Corp., was the third and last speaker. In discussing "Some Observations on the Flex-Cracking Characteristics of Buna S Compounds," Mr. Breckley described the results of a study of the crack growth that proceeded from small nicks made initially in the surface of a sample. A procedure was developed whereby a pin hole about .025 inch in diameter and approximately .05 inch in depth was made in the center of the grooved surface of the test pieces, this hole being made by a pointed piece of steel, shielded so that it could penetrate into the samples only to a constant depth. Crack growth extending from the hole during flexing of the samples thus prepared was fairly uniform and the results were reproducible within rather close limits.

The speaker noted that the rate of crack growth in the test pieces was affected particularly by the state of cure and the degree of loading of the stocks—the tighter the cure and the higher the loading, the more rapid the crack growth. Since Buna S is more brittle at elevated than at room temperatures, the tests were conducted at 100°C. Many compounds were tested at the higher temperature and it was discovered that some which had not cracked too badly in 50,000 flexes at room temperature failed completely in about a tenth of the time when flexed at the higher temperature, although in general the results at the higher temperature confirmed those obtained at room temperature. Compounds developed giving interesting results, particularly those containing hard clay, were discussed.

(EDITOR'S NOTE: An article based on Mr. Breckley's talk, reproducing the several slides on crack growth, will appear in an early issue of RUBBER AGE.)

Coming Events

June 17. Rubber & Plastics Group, A.S.M.E., Hotel Biltmore, Los Angeles, Calif.

June 18. R.I. Rubber Club, Metacomet Golf Club, East Providence, R. I.

June 25. Boston Rubber Group, Annual Outing, Commonwealth Country Club, Boston, Mass.

June 28-July 2. Annual Meeting, A.S.T.M., Wm. Penn Hotel, Pittsburgh, Penna.

July 24-25. Los Angeles Rubber Group, Annual Outing, Uplifter's Club, Los Angeles, Calif.

Sept. 6-10. American Chemical Society, 106th Meeting, Pittsburgh, Penna.

Oct. 5-7. National Safety Council, Sherman, LaSalle and Morrison Hotels, Chicago, Ill.

Dec. 6-11. 19th Exposition of Chemical Industries, Madison Square Garden, New York City.

Detroit Group Hears Temple

Dr. J. W. Temple, of the Tire Compounding Department of the U.S. Rubber Co., Detroit Plant, was the principal speaker at the Spring Meeting of the Detroit Rubber & Plastics Group, Inc., held at the Hotel Detroit-Leland in Detroit on May 21. He spoke on "Synthetic Rubber and Tires" and was assisted by Dr. W. H. Hulswit, of the same department, in some practical demonstrations indicating differences in resilience, tack and other characteristics. In his talk, Dr. Temple reviewed the supply situation of the synthetics and outlined the major differences between them and the properties of natural rubber. Approximately 70 members and guests attended the meeting.

R. I. Club to Hold Outing

The Spring-Summer Meeting of the Rhode Island Rubber Club will be held at the Metacomet Golf Club, in East Providence, R. I., on Friday, June 18. A golf tournament, with prizes to winners of various events, will be held in the afternoon. Dinner will be served at 7:00 P.M., and a special program will then be presented. Owen E. Lowe, of the Davol Rubber Co., Providence, R. I., is secretary-treasurer of the club.

NAMES IN THE NEWS

RUSSEL G. ALLEN, formerly manager of manufacturing operations in the southwest for Godfrey L. Cabot, Inc., has been elected a vice-president of that company and has moved to the main office in Boston, Mass. He has been with the Cabot organization since 1925. HUGH BURDETTE, formerly eastern production manager of the company, will act as manager in the southwest.

ARTHUR S. POUCHOT, controller of the Lee Tire & Rubber Co., Conshohocken, Penna., has been reelected a director of the Philadelphia Control of the Controllers Institute of America.

ELMER R. MILLER, manager, molded goods division, Industrial Products Sales Division, B. F. Goodrich Co., Akron, has retired from active service after 44 years of continuous service with the company. He started as a stenographer in 1899.

DR. DONALD H. POWERS, well-known authority in the field of textile research and production, has joined the staff of the Merrimac Division of the Monsanto Chemical Co. as a specialist on applications of Monsanto chemicals in the textile industry.

DR. WILLIAM D. OVERMAN, curator of the Ohio State Archeological and Historical Society at Columbus, Ohio, since 1934, has been appointed historian for the Firestone Tire & Rubber Co., Akron.

GILBERT H. SWART, chief chemist of the Wabash, Indiana, plant of the General Tire & Rubber Co., has been transferred to the Akron plant where he will supervise synthetic rubber research.

D. C. MCROBERTS, superintendent of the packing division at the Waukegan, Ill., plant of the Johns-Manville Corp. for the past two years, has resigned from that company and has joined the Aetna Rubber Co. at Cleveland, Ohio, where he will work on development and production. He was formerly associated with the Gates Rubber Co. and served at one time as editor of *India Rubber World*.

GERARD KUCKRO, formerly in charge of the laboratory of the Revertex Corporation of America, is now technical superintendent of the Royal Electric Co., Pawtucket, R. I. The company manufactures insulated wire.

R. R. BLACKWOOD, technical director of Dunlop Rubber of Australia, Ltd., is currently visiting the United States on a mission for the Australian Government. He was accompanied to this country by CHARLES GRAINGER of the Olympic Tire & Rubber Co., also of Australia.

R. A. DONLEY, formerly in charge of industrial relations at the Naugatuck Chemical plant of the U. S. Rubber Co., has been appointed supervisor of personnel in the Industrial and Public Relations Department of the parent company. T. J. KIERNAN has been named supervisor of training in the same department.

WILLIAM A. WEAVER, treasurer of the Arabol Manufacturing Co. since 1938, and one-time treasurer of the Federal Electric Home and Farm Authority, has been elected president of the Arabol company, succeeding the late HENRY KOHLER.

JOHN M. MILLER, who has been acting as factory manager of the Scioto Ordnance Plant, operated by the U. S. Rubber Co. in Ohio, has been named factory manager of the Los Angeles plant of U. S. Rubber. J. M. LIVERMORE, production manager of the ordnance plant, is now the ranking executive at that plant.

THEODORE T. FOLEY, formerly connected with the Goodyear Tire & Rubber Co., Akron, and now associated with the Rubber Development Corporation as a field technician, was slightly injured in an airplane crash in Costa Rica last month. Although he managed to return to San Jose, the pilot of the plane and two other passengers are still missing at this writing.

EDGAR MONSANTO QUEENY, chairman of the board of the Monsanto Chemical Co., has written a book, "The Spirit of Enterprise," which will be released about July 4. The book is described as "a businessman's attempt to reorientate himself in the present troubled world and confused outlook."

DR. G. S. WHITBY, professor of rubber chemistry at the University of Akron, was one of the principal speakers at the annual meeting of the Industrial Research Institute, held at the Hotel Biltmore in New York City last month. He discussed the importance of post-war planning and the part technical research is expected to play in such planning.

DEWEY B. LYONS, formerly purchasing agent of engineering supplies for the Goodyear Tire & Rubber Co., Akron, who entered the Army as a Major some time ago, has been promoted to the rank of Lieutenant Colonel. He is in the Quartermaster Corps at Camp Lee, Va.

REAMER E. SEWELL, head of the quota section of the Tire Rationing Branch of OPA, has resigned from that post to return to his former position in the sales department of the Goodyear Tire & Rubber Co.

Relocate Plantation Men

A check-up conducted by the Goodyear Tire & Rubber Co. of former members of its rubber plantations in Sumatra indicated that while they are relocated in scattered areas, most of them are still with the company or with the government. Paul Shoaff, who was in charge of the plantations, is head of the synthetic rubber plant Goodyear will operate in California. F. W. Weida and Dick Arnold, plantation managers, are both with the purchasing department at Akron. W. T. T. Ten Broeck, research chemist, is in the Akron laboratory. R. B. Bogardus is assistant to the president of the Rubber Development Corp. at Washington, D. C. J. B. Ingle, assistant manager of the crude rubber department, now heads the company's entire synthetic program. J. J. Blandin, who is vice-president of the Goodyear Plantation Co., the activities of which are now considerably reduced, still heads the company's crude rubber department at Akron.

Expand Naftolen Production

The production of Naftolen, compounding aid for natural and synthetic rubber, has been expanded considerably during the past few months, according to an announcement made by the manufacturer, the Wilmington Chemical Corp., New York City. Plans for still further capacity are currently under consideration. Along with expanding plant operations, the company has enlarged its research and development laboratory which now includes fully-equipped rubber and plastic units, as well as facilities for raw material evaluation. Efforts of the rubber laboratory are currently concentrated on GR-S (Buna S). Edmond du Pont, son of the late Francis I. du Pont, has been named vice-president in charge of plant operations.

Washington Appointments

L. J. D. HEALY, consulting technologist of Milwaukee, Wisconsin, has joined the Office of the Rubber Director at Washington, D. C.

NOEL M. LANHAM, associated with the tire division of the U. S. Rubber Co. for many years, is now with the Office of the Rubber Director, Washington, D. C.

LESTER V. CHANDLER, professor of economics on leave from Amherst College, has been appointed price executive of the Rubber Price Branch of OPA, filling the post left vacant several months ago by the return to private industry of ROBERT F. BRYAN.

SPARKS E. BONNETT, who was assistant chief of the Tire Rationing Branch of OPA, has been made chief of that branch, succeeding ROBERT S. BETTEN, who has resigned to accept a commission in the Navy.

A.S.T.M. COMPLETES PROGRAM FOR ITS ANNUAL 1943 MEETING

The program for the Annual Meeting of the American Society for Testing Materials, which will be held at the Hotel William Penn in Pittsburgh on June 28 to July 2, has been virtually completed. It includes 15 technical sessions, a Symposium on Significance of Hardness Testing, the presentation of the 18th Edgar Marburg Lecture, and various committee meetings. The Lecture, on "Wood as an Engineering Material," will be given by L. J. Markwardt, Chief, Division of Timber Mechanics, U. S. Forest Products Laboratory, Madison, Wisconsin.

The Symposium on Hardness Testing, which is part of a series of discussions on the significance of various tests in relation to design, will feature the fourth session of the meeting on Tuesday, June 29. Prof. J. M. Lessells (M.I.T.) will discuss "The Value of the Indentation Hardness Test"; S. R. Williams (Amherst College) will cover "Present Types of Hardness Tests;" S. L. Hoyt (Battelle Memorial Institute) will present "Fundamentals of Hardness Testing;" and J. O. Almen (General Motors) will talk on "Some Limitations of Our Present Hardness Testing Methods." Prepared discussion will also be presented by other leaders in the field.

Rubber Committee to Report

Committee D-11 on Rubber Products, of which J. H. Ingmanson (Bell Telephone Labs.) is chairman, will meet on Thursday morning, July 1. As a contribution to the war effort the committee has prepared specifications for rubber and synthetic compounds for general mechanical, aeronautical and automotive use (except tires). Methods of testing compressed asbestos sheet packing and a test for low-temperature brittleness of rubber and rubber-like materials, which have been submitted for publication as tentative, will be discussed.

Also on the committee's agenda is a proposal that the tentative method of testing sponge rubber products be revised and adopted as standard. A resume will be given of the activities of the committee dealing primarily with the effort to change from natural to synthetic rubber compounds. New proposed tentative specifications for insulated wire and cable, polyvinyl insulating compound, will also be discussed.

A feature of the committee's meeting will be the presentation of a paper on "The Application of Flow Data in Design Problems," by Irving L. Hopkins and Robert Burns, of the Bell Telephone Laboratories, Inc. This paper will be in two parts, the first part dealing with the relaxation or decrease in stress of rubber-like materials when subjected to constant deformation, such as in gaskets, while the second part will discuss the use of flow data of rigid plastics in connection with design and assembly practices.

FINANCIAL NEWS

Lee Rubber & Tire Corp.

Six Months Ended April 30: Net profit of $602,585, after provision of $1,112,585 for state and Federal income and excess profits taxes, equal to $2.50 a share, which compares with $598,364, or $2.48 a share, after provision of $323,703 for taxes, in the corresponding period of the previous year. Net sales amounted to $11,528,928 for the period, an increase of 44.7% from $7,967,972.

Thermoid Company

First Quarter: Net profit of $242,475, against $210,029 in the corresponding quarter of the previous year. Net profit for the twelve months ending March 31, 1943, amounted to $466,890, as compared to $678,295 for the twelve months ending March 31, 1942. The report states that no excess profits tax reserve is set up on first quarter reports.

Raybestos-Manhattan, Inc.

First Quarter: Net profit of $468,532, after provision of $1,877,750 for Federal income and excess profits taxes, equal to 75 cents a share, which compares with $485,619, or 77 cents a share, in the 1942 quarter. No credit was included for post-war refund of excess profits taxes.

United Carbon Company

First Quarter: Net profit of $507,139, after provision of $393,000 for Federal income and excess profits taxes, equal to $1.27 a share, which compares with $522,111, or $1.31 a share, after provision of $345,000 for Federal taxes, in the 1942 quarter.

Collyer Insulated Wire Co.

For 1942: Net income of $1,616,997, after provision of $384,585 for Federal income tax and $4,606,532 for excess profits tax, which compares with $252,832 after $350,320 taxes, in the preceding year. Net sales amounted to $18,994,856 in 1942 against $10,497,917 in 1941.

Norwalk Tire & Rubber Co.

Six Months Ended March 31: Net profit of $61,246, equal to 22 cents a share on the common stock, which compares with $64,293, or 24 cents a share, reported for the corresponding period of the previous year.

Belden Manufacturing Co.

First Quarter: Net income of $140,000, after provision of $325,000 for taxes, equal to 51 cents a share, which compares with $133,000, or 44 cents a share, in the corresponding 1942 quarter. Net sales rose from $2,273,000 to $2,715,000.

TROPICAL AMERICA'S OUTPUT IS DISCUSSED BY E. G. HOLT

The production of crude rubber in Tropical America in 1943 cannot reasonably be expected to surpass the peak output of 62,000 tons attained in 1912, according to E. G. Holt, chief of the Commercial Research Section of the Rubber Development Corporation, in an article on "The Inter-American Rubber Agreements," which appears in the April-May, 1943, issue of *Arbitration in Action*, published by the American Arbitration Association, 9 Rockefeller Plaza, New York City.

Reviewing the circumstances leading up to the signing of special agreements on the procurement of rubber from 15 of the Latin American countries, Mr. Holt points out that even a few hundred tons of rubber might prove a highly important factor in winning the war and therefore even the relatively limited quantities that can be obtained from these countries by great effort and expense are well worthwhile. He adds that rubber production in these countries in 1943 is unlikely even to approach closely the peak 1912 output.

Measures taken to encourage the production of rubber in the Latin American countries, Mr. Holt states, include financial aid to enable collectors to extend existing areas of exploitation and to tap entirely new areas; assistance in methods of tapping and preparation of rubber; aid in securing labor; provision of supplies, equipment and food on liberal terms; and provision of means of transport into and from areas hitherto inaccessible.

Mexican Plant for Goodyear

Construction of a new rubber factory in Mexico City has been started by the Goodyear Tire & Rubber Co. The plant, which will have a capacity of about 300 tires per day, and which will also produce mechanical goods, will cost approximately $500,000 and will take about a year to complete. It will be operated by the Compania Hulera Goodyear-Oxo, an organization resulting from the recent affiliation between Goodyear and the Compania Hulera Oxo, an all-Mexican organization. It is believed that the plant, which is expected to make full use of guayule, represents the first rubber factory in Mexico in which American interests have a direct investment.

Conway Heads Bishop Company

James M. Conway, vice-president in charge of purchasing of the Bishop Gutta Percha Co., New York City, and associated with that company for the past 25 years, has been elected president, succeeding the late Henry D. Reed. Long identified with purchasing activities, Mr. Conway is a member of the Purchasing Agents Association of New York. He is also a member of the Electrical Associates Club.

NEWS IN BRIEF

Ameripol is being used in a specially designed thermostat used to control the temperatures of lubricating oil used in certain aircraft engines, according to a Goodrich announcement. Ameripol is said to be the only material which can perform the required function and still maintain the accuracy demanded of the thermostat.

O'Sullivan Rubber Co., Winchester, Va., will sponsor a series of 15-minute broadcasts featuring Leon Henderson, former OPA administrator. The programs will be heard over the Blue Network of the National Broadcasting Co. and will begin on August 14.

A rubber-lined hose system installed by Goodyear in a big anthracite breaker in northeastern Pennsylvania more than 10 years ago is still carrying thousands of tons of sand and water every day. The installation consisted of the company's Diversipipe.

More than 600 standards, 94 of which represent new and revised standards approved since the last edition, are included in the new List of American Standards just released by the American Standards Association, 29 West 39th St., New York City. Copies are free on request to the Association.

Scores of questions pertinent to the operation of automobiles under war emergency regulations are answered in a new and handy booklet recently issued by Firestone under the title "Valuable Information for Every Car Owner." Two pockets are provided in the booklet for tire inspection records and gasoline rationing books.

A new soybean oil-extractor using a nonflammable safety solvent has been developed by the Detroit Rex Products Co., Detroit 21, Michigan. The device is reported to leave less than 1% of fat in the meal.

A company which utilizes a special process for chrome hardening surfaces of engine cylinders, gun barrels, and other products, is reported to be using Koroseal sheet as the best insulator yet found for use in plating such products, according to a Goodrich announcement. A pilot plant where other concerns are being instructed on the process is in operation.

American Wringer Co., Inc., Woonsocket, R. I., has revised its group insurance program for employees by adding hospital expense and surgical operation benefits. The plan is underwritten by the Metropolitan Life Insurance Co.

A new booklet containing technical data and engineering information on U. S. Royal airplane tires has been issued by the U. S. Rubber Co., New York City. A complete description of airplane tire dimensions, tire and rim measurements, tire and tube weights, non-skid contact area figures, and maximum worn section dimensions are included.

To guide the training of students of its Apprentice School, Goodrich has published a 26-page manual outlining all the details of the various courses of study conducted by the school. Copies of the manual are offered witihout charge to other companies which have similar programs or are contemplating them.

A hand-operated bench-mounting machine to mark plastic parts by applying a special ink picked up from a plate by synthetic rubber type has been developed by the Acromark Co., Elizabeth, N. J.

Industrial Latex Co., New York City, has enrolled its employees and their dependents in a new medical and surgical care plan developed by Group Health Cooperative, Inc., 1790 Broadway, New York City. The latter is a non-profit medical service corporation supervised by the State Insurance Department.

Although self-sealing fuel tanks are associated usually with airplanes, Goodyear has revealed that these tanks are also being used with good results on several types of combat vehicles. Tanks on such vehicles are said to have withstood many tests and actual battle conditions in various parts of the world.

Battery pads composed of loomed sisal impregnated with reclaimed rubber have been developed by the Automotive Rubber Co., Detroit, Mich., to replace the molded rubber battery pads previously used. Only 7% of the amount of rubber formerly required is consumed in the new pads.

A new Directory of Commodities and Services, designed to help persons contacting OPA to find the unit which has specific knowledge of their problems, was recently prepared. It is the first of such directories to be made public, and can be secured from the Superintendent of Documents, Washington, D. C., for 30c a copy.

An illustrated booklet describing the current activities of Eimer and Amend, under the title of "Eimer and Amend Today," has been issued by that company. Copies are available on request to the company at 635 Greenwich St., New York City.

COLLYER SEES CONSUMPTION OF 2,000,000 TONS ANNUALLY

World consumption of 2,000,000 tons of natural and synthetic rubber per year, nearly twice as much as ever consumed in any one year, was forecast in the post-war period by John L. Collyer, president of the B. F. Goodrich Co., in a talk before the New York State Chamber of Commerce in New York City on June 3. Mr. Collyer based his prediction on the assumption "that sound policies would be followed and low-cost rubber—natural or man-made, probably both—would be available throughout the post-war world."

"It is no longer a foregone conclusion that the Japanese will destroy the rubber plantations in the Far East when they are driven out," Mr. Collyer stated. "Since we shall soon be able to rely upon synthetic rubber production the destruction of the trees would not have the effect now, as it once would have, of seriously crippling the ability of the United Nations to fight and win the war."

He recommended that synthetic rubber facilities in this country be kept intact and in operation on at least a limited basis, between 150,000 and 250,000 tons production a year, adding that "it seems inevitable that the American people will want to continue at least standby operation of these plants—just as they will want to retain air bases and battleships."

The Goodrich president pointed out to his audience that the average citizen—as a taxpayer—was now in the rubber business to the extent of $650,000,000—the investment in the overall synthetic rubber program. This investment, he emphasized, in itself is three-quarters as large as the entire rubber manufacturing industry of the United States was in 1939, when it had $865,000,000 worth of private capital invested in it.

Discussing the question of economics, Mr. Collyer said that he was sure that the price of synthetic rubber for general use as a replacement for crude rubber will be steadily reduced as more experience is gained and output further increased. Recalling that he testified before a Senate committee some three years ago that general-purpose synthetic rubber could be made in this country for as low as 25 cents a pound, he said that if he were asked now to view future cost of quantity production under peacetime conditions he would set a materially lower figure.

Mr. Collyer remarked that the likelihood of synthetic rubber at 16 cents a pound had been mentioned by officials of the Office of the Rubber Director, adding that "it will take a lower cost than this to eliminate crude rubber on economic grounds."

A non-rubber, waterproof, pressure-sensitive cloth tape, which is finding wide application in war industries, has been developed by the Mystik Tape Division of the Chicago Show Printing Co., Chicago, Ill.

LOS ANGELES RUBBER GROUP GETS PICTURE OF CHINA WAR

A picture of the scores of atrocities committed by the Japanese in their war against China was revealed to the Los Angeles Group, Rubber Division, A.C.S., at its regular meeting held on June 1 at the Mayfair Hotel in Los Angeles. The picture was disclosed by the Rev. Ralph L. Phillips, founder and superintendent of the South China Gospel Mission, who was an eye-witness to many of these atrocities. The meeting, attended by approximately 110 members and guests, was the last of the season to be held by this group.

Dr. Phillips, a close friend of Madam Chiang Kai-Shek, was originally a resident of Los Angeles, but has spent some 26 years in China. He told a blood-curdling story of the suffering inflicted on the Chinese people and in addition showed moving pictures of the war, including pictures of the sack and burning of Shanghai. His story so impressed his listeners, that he was presented with a large sum of money for his work and in addition was given the victory stamps and bonds by members who won them as prizes during the meeting.

Door prizes, donated by the group, consisted of $3.75, $5.00 and $10.00, respectively, in war savings stamps. These were won, in the order listed, by C. M. Reinke, Arthur McMurray and Charles Kuhl. Special prizes, consisting of a humidor and two carving knives, donated by A. Schrader's Son, through John Hoerger, local manager, went to A. V. Collier, Ben Kirk and L. E. Long. Table favors, consisting of cakes of Ivory soap, were donated by Martin, Hoyt & Milne, Inc., through Monty Montgomery, local representative.

The next regular supper meeting of the group will be held on the first Tuesday in October. The "outing" held last year at the Uplifters' Club in Los Angeles will, however, be repeated this year on July 24 and 25.

Guayule Talk Features Meeting

A talk on guayule by Robert James, rubber technologist at the Mare Island Rubber Laboratory, featured the regular monthly meeting of the Northern California Rubber Group, held at the Hotel Claremont, in Berkeley, Calif., on May 27. Approximately 45 members and guests were in attendance. Mr. James covered the entire field of guayule, from cultivation to compounding, and used numerous slides. At the conclusion of his talk a question-and-answer period was held. Vic Vodra, Pacific Coast representative of the R. T. Vanderbilt Co., then presented the highlights of the recent meeting of the Rubber Division, A.C.S., at Detroit, particularly on the papers presented on the various synthetics. A door prize, consisting of $7.50 in war stamps, donated by the R. T. Vanderbilt Co., through Mr. Vodra, was won by Kenneth Marple of the Shell Development Co.

Training of Women

According to Chairman Paul V. McNutt of the War Manpower Commission, enrollment of women high school graduates in summer courses for engineering, science, management, and war training in more than 1,000 towns and cities is expected to result in furnishing war industry with at least 100,000 trained workers. Courses which train women to serve various industries, popularly known as ESMWT Courses, include four covering the rubber industry, these being: Elements of Synthetic Rubber Manufacture; Synthetic Rubber from Petroleum; Petroleum Chemistry including Butadiene; and Modern Rubber Technology and Practice.

Program for Boston Outing

The program for the regular Summer outing to be held by the Boston Group, Rubber Division, A.C.S., has been announced. The outing will be held at the Commonwealth Country Club in Boston on Friday, June 25, and in addition to the usual golf tournament will also feature horseshoe pitching, darts, horse racing, and other sports. Bridge and other card games will also be in order. Dinner will be served at 6:30 P.M. and following dinner a technical paper on synthetic rubber will be given by W. H. Peterson of the ORD. It is pointed out that OPA Regulation No. 25 permits the use of automobiles to attend meetings of this nature. Members and guests planning to attend are urged to make reservations as soon as possible. These should be made with the secretary-treasurer of the group, Harry A. Atwater, c/o Hood Rubber Co., Watertown, Mass.

Buffalo Group Hears Furnas

Dr. C. C. Furnas, director of research for the Curtiss-Wright Corporation, and author of the widely-discussed article "And Sudden Death," was the principal speaker at the meeting of the Buffalo Group, Rubber Division, A.C.S., held at the Hotel Touraine in Buffalo on May 27. Approximately 65 members and guests were in attendance. Dr. Furnas discussed the future of Man in the next twenty-five years from the standpoint of three essentials—food, clothing and shelter. The tremendous development to occur in air transportation constituted the major portion of his talk. He visualized local helicopter services feeding into high-speed, economically-operated, long distance air lines. In concluding his talk, Dr. Furnas launched into a discussion of sources of energy, in which field he has excelled for many years. The next meeting of the group will be held in the Fall.

MEYER, HUBBARD AND FROST HEAD CHICAGO RUBBER GROUP

Election of officers for the 1943-44 season, held by the Chicago Group, Rubber Division, A.C.S., at the annual business meeting of the group, at the Morrison Hotel in Chicago on June 4, resulted in the following: *Chairman,* E. T. Meyer (Herron & Meyer); *Vice-Chairman,* B. W. Hubbard (Ideal Roller); *Secretary-Treasurer,* F. Frost, Jr. (Frost Rubber Works).

The following were elected as members of the Executive Committee: R. T. Kinsley (Dryden Rubber), D. Seifer (Diamond Wire & Cable), H. I. Houlette (Inland Rubber), W. F. Bernstein (Victor Mfg. & Gasket), S. L. Weller (DuPont), J. P. Sheridan (N. J. Zinc), M. C. Vaughan (Wishnick-Tumpeer), and S. A. Davis (C. P. Hall).

The speaker of the evening was G. A. Taylor, of Stanco Distributors, Inc., whose subject was "Compounding and Processing Butyl Rubber." Mr. Taylor compared butyl to natural rubber, not only in respect to compounding and processing characteristics, but also to the properties of the final vulcanizate. The superiority of butyl in such instances as impermeability to gases and resistance to sun checking were emphasized by the speaker.

During the business session, it was decided to increase the annual dues from $1.00 to $2.00. The next event scheduled by the Group is the annual golf outing which will be held sometime this summer. Details will be announced shortly.

Montreal Group Elects Officers

The following officers have been elected to head the Rubber & Plastics Division, Montreal Section, Society of Chemical Industry, for the 1943-44 season: *Honorary Chairman,* Dr. R. V. V. Nichols (McGill University); *Chairman,* A. B. Lewis (British Rubber); *Vice-Chairman,* Dr. R. S. Jane (Shawinigan Chemicals); *Secretary,* J. T. Dunn (Dominion Rubber). The following committee members were named: *Program,* H. Chauvin (Miner Rubber) and H. L. Blachford; *Publicity,* W. P. B. Gedye (Miner Rubber) and E. A. Thorn (Diamond State Fibre); *Reception,* J. H. McCready (Hale Brothers) and J. R. Mills (Dominion Rubber); *Membership,* L. C. McLeod Monsanto) and W. B. Jonah (Northern Electric). The group plans to hold a summer outing, featuring a golf tournament. Details will be announced later.

R. P. DINSMORE, manager of development of the Goodyear Tire & Rubber Co., who has been acting as an Assistant Deputy Director in the Office of the Rubber Director, in charge of research and development of synthetics, has returned to Goodyear. His duties in Washington have been taken over by E. R. GILLILAND, also an Assistant Deputy Director.

Who's Who in Washington—and Where

(As of June 10, 1943—Compiled by the Staff of RUBBER AGE)

OFFICE OF THE RUBBER DIRECTOR

New Municipal Building, 4th and D Sts., N.W., Washington, D. C.

Rubber Director—William Martin Jeffers.
Special Assistants—B. W. Rapp and Darrell O. Churchill.
Deputy Rubber Director—Col. Bradley Dewey.
Assistants—Morehead Patterson and Stanley Osborn.
Assistant Deputy Rubber Directors—L. D. Tompkins (Operations), Frank R. Creedon (Plant Construction), E. B. Babcock (Technology and Specifications), E. R. Gilliland (Research and Development of Synthetics).
Administrative Officer—Frank P. Downey, Jr.
Head, Education Program—Dr. H. E. Simmons, assisted by J. M. Ball (Editorial), E. B. Busenberg (Reclaim), D. F. Fraser (Neoprene), C. W. Sanderson (Thiokol), A. H. Nellen (Tires and Tubes), R. F. Wolf (Butyl), Arthur Nolan (Latex and Dispersions), and M. N. Harocopo (Statistics).
Assistant to Rubber Director—Kenneth Burgher.
Head, Product Specifications—C. S. Reynolds, assisted by V. R. Grainger, Walter Juve (Wire and Cable, etc.), R. C. Dabney (Tape, Proofed Fabrics, etc.), R. J. Hull (Tires and Tubes, etc.), S. C. Compher (Tire Retreading), and Addis Finney (Revision of Specifications).
Head, Natural Rubber—Atherton Lee.
Manager, Priorities and Materials Control—S. P. Dorsey.
Manager, Allocations—George B. Kayser.
Manager, Requirements and Capacities—James H. Higgins.
Supervisor, Mechanical Goods—J. E. Skane.
Research Associates—A. E. Boss, R. A. Crawford, D. A. Cutler, J. C. Elgin, Harry L. Fisher, C. S. Fuller, P. S. Greer, George Haslam, J. E. Hutchman, R. W. Kixmiller, G. Lyons, M. Rea Paul, C. W. Perry, C. F. Prutton, Norman A. Shepard, J. E. Troyan, P. H. Watkins, W. B. Wiegand, and R. R. Williams.

RUBBER DEVELOPMENT CORPORATION

1626 K St., N.W., Washington, D. C.

President—Douglas H. Allen.
Assistants—R. B. Bogardus, James C. Roberts and R. O. Case.
Vice-Presidents—John W. Bicknell, Reed Chambers, Paul McKee and William E. Mitchell.
Treasurer—W. C. Beck.
Head Field Technician—C. B. Manifold.
Associates—Earl M. Blair and W. A. Stanton.
Rubber Analyst—Preston W. Barker.
Distribution Specialist—Richard Cooke.
Chief of Procurement—E. B. Murphy.
Chief Procurement Analyst—A. J. Lockwood.
Chief, Plantations Division—M. D. Knapp.
Assistant Chief—Valentine O. Goodell.
Rubber Specialist—L. B. Proctor.
Administrative Assistants—Curtis E. Anderson, John H. Brunner, Don C. Carnes, Harry A. Carragher, John D. Farnham, Wm. E. Flanagan, Wm. V. Garrett, Walker A. Graham, Alexander Hart, Everett G. Holt, Robert M. Hutchins, Morris K. Jessup, John C. Lang, Wm. Lavarre, Geo. E. Lawrence, Robert E. Lees, Wm. J. McNamee, E. W. Mills, L. B. Proctor, Charles B. Rollins, Harry Shere, G. W. Sniffin, George A. Steiner, Norman F. Sulzbach, Robert G. Walker, R. S. Walter, and Robert Welsher.
Commercial Research—E. G. Holt.
Senior Research Analyst—J. F. Dunbar, Jr.
Assistant Production Specialists—Richard S. Smith and G. R. Ward.

Note: The Purchasing Department is in the H.O.L.C. Building, 1st and Indiana Ave., N.W., Washington, D. C.

RUBBER RESERVE COMPANY

811 Vermont Ave., N.W., Washington, D. C.

Chairman of the Board—Jesse H. Jones.
President—Howard J. Klossner.
Special Assistant—China R. Clarke.
Vice-Presidents—R. D. Young, Henry A. Mulligan, Stanley T. Crossland and John W. Livingston.
Secretary—George H. Hubert.
Treasurer—W. C. Beck, Jr.
General Counsel—H. Clay Johnson.
Consultant—A. L. Viles.
Scrap Rubber—W. J. McCauley.
Latex—Richard Baybutt.
Sales—H. C. Bugbee.
Chief, Administration Division—W. H. Sullivan.

OFFICE OF PRICE ADMINISTRATION

Third and Independence Ave., N.W., Washington, D. C.

Rubber Price Branch

Price Executive—Lester V. Chandler.
Chief Counsel—John N. Cole.
Head, Raw Materials and Financial Section—George W. Bolton.
Head, Tire Price Section—Robert V. Mitchell.
Head, Other Rubber Products Section—Everett D. Hawkins.
Head, Rubber Section, Accounting Division—John S. Bartlett.
Head, Rubber Section, Standards Division—T. M. Miller.
Head, Special Projects Section—Kenneth E. Lawton.
Administrative Officer—Arthur F. Schalk, Jr.

Automotive Supply Rationing Division

Director—Charles F. Phillips.
Legal Counsel—David L. Lloyd.
Head, Field Section—H. C. Butkiewicz.
Administrative Officer—John B. Annett.
Chief, Tire Rationing Branch—S. E. Bonnett.
Heads, Tire Rationing Branch—R. G. Leeth (Eligibility Section), A. Koehler (Tire Industry Section), A. G. Richtmyer (Research Section), L. A. Brown (Tire Inspection Section), and Frank Dougall (Quota Section).

GUAYULE EMERGENCY RUBBER PROJECT

315 West 9th Street, Los Angeles, California

Assistant Chief, Forest Service—C. M. Granger.*
Executive Officer—G. R. Salmond.*
Director—Evan W. Kelley.
Assistant Director—E. L. Perry.
Associate Director—Paul H. Roberts.
Chiefs—L. C. Stockdale (Business Management), J. R. Nelson (Personnel and Labor), John L. Emerson (Nursery Management), Henry L. Lobenstein (Plantation Management), Dr. W. G. McGinnies (Surveys and Investigations), James J. Byrne (Engineering and Mill Operation).
Director of Research—Dr. A. C. Hildreth.
Assistants—Dr. LeRoy Powers (Plant Breeding), Dr. Hamilton P. Traub (Plant Physiology), Dr. William A. Campbell (Pathology), Delmar C. Tingey (Agronomy), Dr. Omar J. Kelley (Soils), Raiford L. Holmes (Rubber Analyses), Harold W. Reynolds (Indicator Plots), S. W. McBirney (Agricultural Machinery).
Entomology—T. P. Cassidy.

Note: Most of the personnel listed above are members of the Forest Service, while others are officially members of the Bureau of Plant Industry. They are all located at the Los Angeles address, except those indicated by an asterisk, the latter being located at the Department of Agriculture in Washington, D. C.

LOS ANGELES NEWS

Plans are complete and reservations are being taken rapidly for the annual summer "outing" of the Los Angeles Rubber Group. The outing will be held at the Uplifter's Club on July 24 and 25. The outing last year was well attended and proved such a general success that the plea for a repetition of the event was practically unanimous.

Karl Faulhaber, proprietor of the Faulhaber Rubber Company, 1346 East Slauson Avenue, reports that he is increasing the size of his factory by an addition which measures 45 by 100 feet. He is installing plywood manufacturing equipment on a larger scale than ever. Molded plywood has been added to his line.

Phil Drew of the Goodyear Tire & Rubber Company has returned from a trip to Akron, Ohio.

Visitors at the monthly supper of the Los Angeles Rubber Group this month included Major E. W. Kelley, director of the Emergency Guayule Rubber Project of the Department of Agriculture at Salinas, California; Doctor J. A. Hall, chemist connected with the United States Forest Service, who has been doing chemical research work in connection with the guayule project; and Harry Wright, agent for the Defense Supply Corp. in Los Angeles.

Ray B. Stringfield, process engineer for Vultee, is still finding time to do a little lecturing to student groups. Recently he gave the Faraday Lecture at the Pasadena Junior College. He also spoke recently on "Materials" at the University of Southern California before the War Production Board.

Vic Vodra, local representative of the R. T. Vanderbilt Company, Inc., has returned from an extensive trip through the east and northwest. Since his return he has also made a business trip to San Francisco. While in Oakland he addressed the Rubber Group which holds a monthly supper in that city.

John L. Collyer, president of the B. F. Goodrich Company, recently spent five days in the Los Angeles area. He was the honor guest at a reception at the California Club where a large number of industrial and civic leaders of California gathered at a luncheon to meet Mr. Collyer and hear him speak. He left for the east on May 23.

W. S. Richardson, general manager of the International Product Sales Division of Goodrich, also spent a week in Los Angeles during the past month. He brought with him a display of rubber goods and he also presented the new color-sound motion picture film. The new picture takes about thirty-five minutes and shows a large number of the thirty-two thousand different rubber products manufactured by the company.

Newton Miner, products control and research manager in the high precision Molded and Synthetic Rubber Products Department of the Miller Rubber Company Division of the B. F. Goodrich Company, was in Los Angeles a few days during the past month doing some work in connection with aeronautical developments. Mr. Miner was sent to Alaska last winter to study the effects of extremely low temperature on rubber parts in planes, and his report is considered of primary value to the aircraft industry.

Herman C. Klein, product sales manager of rubber and synthetic pipe linings for Goodrich, has been in the West during the past month.

The Los Angeles plant of Goodrich was awarded the Army-Navy "E" on May 10. This is the first "E" to be awarded to a Pacific coast rubber plant, but it is the seventh Goodrich plant to be so honored.

Garvin Drew, sales manager for A. Schrader's Son, who now makes his headquarters in Brooklyn, New York, spent ten days in the Los Angeles area in the latter part of May. Mr. Drew had been gone from Los Angeles three and one-half years.

H. F. Parkerton, Sr., local manager for the Farrel-Birmingham Company, was seriously ill for a few days during the past month but was back on the job toward the end of the month.

Bob Abbott, of the C. P. Hall Company of California, took a much needed vacation in May and later came back on the job noticeably refreshed.

Charlie Reinke, of Reinke, Hiller and Amende, was on the sick list during the month of May but is much improved at this writing.

Stokes Royal, son of Ed Royal of R. H. Royal, Inc., has arrived in America from Cairo, Egypt. The young man has been in the service about a year and a half and has seen active service in various places. Mr. Royal's other son is also in the service.

A. D. Nast, Jr., president of Western Insulated Wire, Inc., manufacturers of electrical wires and cables, with factory at 1001 East 62nd Street, has been appointed assistant executive in Great Britain for the American Red Cross. He is scheduled to leave Los Angeles about June 20 for Washington, D. C., where he will undergo a short period of special training before leaving for England.

Mr. Nast, one of the younger executives in the rubber industry, is well known throughout the Southern California area. He is well qualified to handle the special assignment given to him, which will include assistance in the formation of hotels, canteens and recreation centers, as well as the coordination of activities with the armed forces. Mr. Nast is married and has one son.

A. D. Nast, Jr.
takes Red Cross post in England

Charge Collyer Co. with Fraud

Charges of conspiracy to defraud the government by "manufacturing, producing and delivering defective wire and cable by frauds and deceptions practiced on inspectors of the War and Navy Departments" were brought against the Collyer Insulated Wire Co. recently. The charges came to light when the defendant company, and eight of its officials, were arraigned in the U.S. District Court in Providence, R. I., on June 14. Not guilty pleas were entered for all of the defendants. The charges are similar to those recently levied against the Anaconda Wire & Cable Co.

Textile Proofers Moves

Textile Proofers, Inc., originators of the Capitol Process liner treatment, which prevents adhesions, accelerates separation, and preserves the life of cotton fabrics, has moved its offices and factory to 181 Culver Avenue, Jersey City, N. J. The telephone number is BErgen 3-6183. Greater production facilities are available in the new location.

OBITUARIES

Fred B. Peterson

Fred B. Peterson, president of Fred B. Peterson & Co., Inc., well-known crude rubber brokerage firm, died on June 14 in St. Peters' Hospital in Brooklyn, N. Y., where he had been a patient for two days. He was 67 years of age.

Born in Rockford, Illinois, in 1876, Mr. Peterson attended the University of Wisconsin from which he was graduated in 1898, receiving an LL. B. two years later. Joseph E. Davies, former United States Ambassador to Russia, was one of his friends and classmates.

For some years Mr. Peterson practiced law in Milwaukee, but upon the entrance of the United States into World War I he went to Washington where he became Director of Imports for the Federal War Trade Board. His work with the Board included the handling of crude rubber imports and led him, in 1923, to organize the rubber brokerage bearing his name. Headquarters were maintained at 120 Wall Street in New York City until the middle of 1942 when, due to the current situation in rubber, the company dropped most of its activities.

Mr. Peterson traveled widely in connection with his work. He was recognized as a pioneer developer of the use of rubber from French Indo-China in this country, and was a constant contributor to newspapers, magazines and trade journals. He was a member of India House, New York Yacht Club, Montauk Club, Oakland Golf Club, Psi Upsilon fraternity, the St. Andrews Society, and the Devonshire Club of London. At one time, he was a partner in J. F. Dunbar & Co., also dealing in crude rubber, this organization having been liquidated about a year ago.

Lothar W. Faber

Lothar W. Faber, president of the Eberhard Faber Pencil Co., of Brooklyn, N. Y., and vice-president of the Eberhard Faber Rubber Co., of Newark, N. J., died at his home in New York City on May 12, at the age of 81. Death came after a brief illness.

Mr. Faber, a son of Eberhard Faber, founder of both the pencil company and its rubber affiliate, was born in New York City in 1862. He attended private primary schools and was graduated from the Columbia School of Mines in 1882, following which he spent some time abroad. He joined the pencil firm in 1885, becoming its president in 1898. He was named vice-president of the rubber concern in 1913, holding that post until his death.

Funeral services were held in New York City on May 14.

Harry F. Webster

Harry Francis Webster, sales manager of the Mansfield Tire & Rubber Co. for the past 27 years, died from an apoplectic stroke suffered at the wheel of his car just outside the Mansfield factory in Mansfield, Ohio, on May 20. He was driving along slowly in the company of J. S. Wainwright, general sales manager of the company, listening to a baseball game on the radio, when the stroke came. Although he was rushed to Mansfield General Hospital, he was dead on arrival. Mr. Webster came to Mansfield in 1916 from Chicago where he was born and where he had been engaged in the rubber business since 1909. A widow and two daughters survive.

Otto A. Frederickson

Otto A. Frederickson, chief engineer for the National Electric Products Corp., Pittsburgh, died on June 5 in St. Mary's Hospital, Orange, N. J., after a short illness. Mr. Frederickson was born in Plainfield, N. J., and was educated in the public schools in that town. He held a number of patents on wire and cable, including one for the A-B-C cable which is finding wide application in war work. A widow and six daughters survive.

Opens Washington Office

Nat Diamond, for many years associated with Fred Pusinelli & Co., Inc., crude rubber brokers of New York City, and more recently connected with the Board of Economic Warfare in Washington, D. C., has opened an office in the Securities Building, 729 Fifteenth St., N. W., in Washington, to represent rubber manufacturers and to assist them with their numerous problems in their dealings with Government agencies. Harold Hunter, recently with the *New York Post*, will be associated with Mr. Diamond.

Absorbs Depew Container Corp.

The American Container Corp., manufacturers of hard rubber battery containers, with offices and factory at Rock Island, Ill., has absorbed the Depew Container Corp., of Depew, N. Y., and in the future the plant of the latter organization will be known as the Depew Plant of the American Container Corp. The Depew concern, which also manufactured hard rubber battery cases, covers and vents, was an affiliate of American Container before its absorption. Operations at the Depew plant are being continued.

Synthol—Tackifier and Plasticizer

A new tackifier and plasticizer for synthetic rubber, including the butadiene copolymers, has been introduced under the name of "Synthol" by the Rubber Materials Division of Genseke Brothers, West 48th Place and Whipple St., Chicago, Ill. Synthol is said to give permanent tack to the synthetics, sheeted stocks of synthetic rubber containing this material retaining the desired tack even when exposed to air for more than a week. Tests are reported to have indicated that the tensile strength of the stocks is not affected while resistance to tear is excellent. After aging for one week in a Geer oven, stocks showed no loss in tensile, with only a very slight increase in Shore hardness. When used as a tackifier, 2 to 5% of Synthol should be added directly to the batch on the mill. It is said to be clean and easy to use, to incorporate with the rubber quickly, and will not break the rubber on the roll. Synthol also has good plasticizing action.

Set Up Cooperating Committees

Sixteen cooperating committees for the purpose of receiving and collating ideas along chemical and engineering lines which may be of importance in the total war effort are being established by the Office of Scientific Research and Development of the War Production Board. Previously, these ideas were submitted directly to Washington, but the regional committees, located in various parts of the country, will be able to handle the preliminary work close to the origin of the idea or suggestion. Burt W. Wetherbee, director of development for the Globe Woven Belting Co., Buffalo, has been named a member of the committee for the Buffalo area, and members of the rubber industry are urged to communicate any ideas or suggestions direct to him. Mr. Wetherbee is also chairman of the Buffalo Rubber Group.

Establish New Laboratories

Research laboratories devoted to the continuing study of synthetic rubber have been established at Kent State University, Kent, Ohio, by the B. F. Goodrich Co. The laboratories and the staff engaged in the activity will be under the direction of Dr. Charles F. Fryling, who has been associated with Dr. Waldo L. Semon, director of synthetic rubber research for Goodrich, for the past six years. The work at the University is planned for only the duration of the war.

Continental Carbon Co., manufacturers of carbon black, recently revealed that women are now working in its plant in Texas. This is believed to be the first time that women have been employed in the manufacture of carbon black and according to the superintendent of the company's Sunray plant they are doing "a commendable job."

CANADIAN NEWS

Nearly ninety compounders and other technical men from the Canadian rubber industry attended a butyl rubber meeting called by the Polymer Corporation, Ltd., at the Royal York Hotel, in Toronto, June 7.

Within two to three months' time the government-owned butyl plants at Sarnia, Ontario, will be in production at the rate of 7,200 long tons yearly. Proportionately, the Canadian rubber industry has twice as much butyl to consume as the rubber industry in the States; 18.9 per cent of the total program being butyl as compared with 8.3 per cent in the U. S. Purpose of the industry technical meeting was to present all available information on the utilization of butyl in order that the program of product development and conversion which lies immediately ahead can be successfully accomplished in the short time available.

Dr. Norman S. Grace, manager of the technical service division of the Polymer Corporation, presided at the Toronto meeting. J. A. Martin, Deputy Rubber Controller, and R. C. Berkinshaw, president of Polymer, opened the session with a discussion of the supply and production pictures.

Policy and plans for utilization of butyl in the United States were discussed by Ralph F. Wolf, consultant on GR-I to the Office of the Rubber Director, Washington, and Canadian plans for utilization were presented by W. R. Walton, Jr., chairman of the Rubber Conservation and Technical Committee. I. E. Lightbown, Stanco Distributors, discussed the processing and compounding of butyl rubber and then conducted an exhaustive question and answer period on these subjects.

The application of butyl in products by industry groups such as tires and tubes, mechanical goods, wire and cable, drug sundries, cements and coated fabrics, and footwear was discussed by Messrs. Lightbown and Wolf and Joseph H. Holmes, Jr., of Polymer Corporation.

The butyl rubber research compounding program also came in for a share of the attention. Dr. G. Stafford Whitby discussed the purpose of this program and the principal butyl defects at which it is aimed. This was followed by a discussion of American plans by Dr. A. E. Boss, of the Office of the Rubber Director, and of Canadian plans by J. C. Howard, who holds a similar position in the Canadian set-up.

Following the general technical meeting of all Canadian compounders, representatives from the wire and cable branch of the industry held a meeting at the Royal York on Tuesday, June 8. Also in attendance were R. A. Schatzel, of the General Cable Company, and A. R. Kemp, Bell Telephone Laboratories, who discussed the latest developments in the wire industry in the States.

According to an announcement made at the annual meeting of the Dominion Rubber Company by Paul C. Jones, president, the company's new small arms project, announced in last month's issue of THE RUBBER AGE, will be known as Dominion Rubber Munitions, Ltd., and will be located in eastern Canada. The new plant will operate under the auspices of Brigadier D. E. Dewar, director-general of the Arsenals and Small Arms Ammunition Branch of the Department of Munitions and Supply. A. C. McKinnon, formerly with one of Dominion's affiliated companies, has been appointed general manager. The plant will employ approximately 1,000 and will be completely equipped to manufacture cases and bullets and to load and test ammunition.

War Price and Trade Board order A-705, recently issued, requires that protective rubber garments such as raincoats, sou'-westers, acid-proof aprons, and similar items may be manufactured and sold only in cases of essentiality.

J. Ross Belton has been appointed general manager of Gutta Percha and Rubber, Ltd., Toronto. Mr. Belton, a veteran of the last war, graduated from Queen's University and joined Gutta Percha in 1920. He has been assistant general manager since 1936.

B. M. "Barney" Costello, factory manager of the B. F. Goodrich Co., Ltd., is one of Kitchener's most enthusiastic victory gardeners. During the regular course of events in preparation of a garden plot, Mr. Costello displayed great skill in the handling of a pitchfork and the spreading of manure. The tumult and uproar that occurred later when he learned that he had manured, not his own, but a neighboring plot is said to have scorched considerable of the early vegetation. Efforts of friends to point out that the extra practice in forking could be put to advantage in getting out of sandtraps this summer failed to lessen the Costello wrath.

Production of two synthetic materials never before manufactured in Canada is scheduled to begin within a very short time. The polyvinyl chloride plant of Canadian Resins and Chemicals, Ltd., has just been completed at Shawinigan Falls, Quebec, and will begin producing in the near future. Manufacture of Thiokol FA by Naugatuck Chemicals, Ltd., will also begin within a short time at Elmira, Ont.

J. Ross Belton

general manager of Gutta Percha

Dulev Plastics, who began manufacturing operations in Toronto within recent months, are now handling custom molding of polystyrene, cellulose acetate butyrate, ethyl cellulose, vinylite, and other thermoplastic materials. The company specializes in intricate moldings and close tolerances and is equipped to manufacture its own molds and dies.

Goodrich of Canada has reported net income of $281,653 for 1942, after provision of $730,393 for income and excess profits taxes. This compares with $115,570 in the previous year, when taxes totalled $200,000.

Wooden soles for footwear for Great Britain are being turned out in enormous quantities in the Granby Last Factory of the Dominion Rubber Co. in Granby, Quebec. Although the manufacture of these soles was only started last April, production is said to have already reached 10,000 pairs daily, and this figure will probably be doubled shortly. The Granby Last Factory was started nearly 50 years ago and normally makes wooden lasts for rubber footwear. Entirely new machinery was required to make the wooden soles. G. S. Norcross is manager of the factory.

Amalgamator Z-4 Plasticizer

Amalgamator Z-4, a new, non-volatile plasticizer for the butadiene copolymers, with a specific gravity of 1.12 and boiling point over 200° C., is being marketed by Hermann Weber & Co., 76 Beaver St., New York City. The new plasticizer is said to impart uncured tack and good cured ply adhesion and to improve tensile and tear resistance. It is recommended in portions of 10 to 15%.

Progress Report No. 3
(of the Office of the Rubber Director)

IN making this, the third Progress Report of the Rubber Program, it is my desire at the very outset to state that the rubber problem has not yet been completely solved. It is a long way toward solution, and we are every day nearer to the time when we can put the construction of rubber plants, as a problem, behind us. But every American must realize that except for essential necessities, rubber cannot become a generally available commodity for a long time, and that extensive conservation of tires and of other rubber products must still be continued. In short, while the Rubber Program is not yet solved, it is in the best shape that it has ever been.

The next four to six months will be the critical period. Most of the synthetic plants will have been built and turned over to the operators who will be held strictly accountable for performance. Synthetic rubber is an intricate chemical compound. Many problems still must be solved, including the scheduling, production, and rationing of synthetic rubber; developing the techniques of using it; deciding in what products specific synthetics should be used; and deciding upon improvements necessary to fill the most pressing needs. This will require strenuous application on the part of highly trained technical staffs cooperating with rubber production men.

CAPACITY

The Baruch Committee recommended a program of 1,037,000 long tons of rated capacity for the United States; additionally, plants were under construction in Canada having a rated capacity of 37,000 long tons, making a total program for the two nations of 1,074,000 tons.

Today, the program under construction in the United States and Canada has a rated capacity of 850,000 long tons, or 79% of the original recommendations of the Baruch Committee, and is divided among plants, many of which are made up of multiple units, as follows:

Product	Plants	Units	Tonnage (Long Tons)
Buna S	14	30	735,000
Butyl	3	5	75,000
Neoprene	1	4	40,000
Total Rubbers	..	..	850,000
Raw materials for Buna S:			
Butadiene	23	32	688,500
Styrene	7	13	202,700
Total Plants	48	84	

In my last report mention was made of several experimental pilot plants. One of these, using the so-called "Polish Process" of making butadiene from grain alcohol, has progressed far enough to warrant the construction of a 10,000 ton plant, which has been approved. Other pilot plants have not yet reached that stage.

PROGRAM REVIEW

The Baruch Report recommended that *"every aspect of the rubber problem must be under continuous review by a man whose sole responsibility it is."* This has been done from month to month, and from day to day.

The Rubber Program is generally visualized as the construction of synthetic plants and the production of rubber only. Nothing could be further from fact.

It would be fatal to the whole program if we have a too ample supply of rubber, but not enough of the many other constituents that go into manufactured products.

My office has therefore the task of seeing to the proper flow to industry of a large number of chemicals, rubber substitutes, fabrics, such as rayon and cotton cords, etc.

Additionally, it is keeping track of the rubber industry's manufacturing and reclaiming equipment, and watching the many requirements for proper compounding such as carbon black, plasticizers, and extenders.

In these operations my staff naturally works closely with other branches of Government in order to see that the whole Rubber Program is in balance, from production to final end-product.

Consideration has been given to the very difficult situation in critical plant components, and the need for them by other vital War programs; to the requirements for rubber of our armed forces, those of our Allies, and of the essential civilian economy; to the possible production of some plants at rates somewhat greater than designed capacity; to the natural rubber supplies coming to us and to our Allies; to the ability of the manufacturing industry to consume; and to the ever-changing conditions arising from expanded and intensive research in and experience with synthetic rubbers by technical men within and outside of the rubber industry.

These considerations have influenced certain basic changes which have been made from time to time, and have resulted in reducing, through the following moves, the rated capacity of the program to its present scope.

1. Eight "refinery conversion" projects have been cancelled. It was originally thought that these could produce butadiene much more quickly than the standard plants which were being built from the ground up. Due to a variety of causes, most of them unforeseen, this hope has not been realized, and their completion would be too late to be of material assistance. Therefore, the critical materials have been released to other projects.

2. "Butyl" and "Neoprene" will not now be needed for military tires, and the need for iso-butylenes (used in "Butyl") is critical in the aviation gasoline program. Therefore, 64,000 tons of "Butyl" and 20,000 tons of "Neoprene" plant capacity have been cancelled.

3. Additional plant capacity originally recommended for the production of 109,800 short tons of butadiene; 33,600 short tons of styrene; and 140,000 long tons of copolymer (Buna S) have not yet been approved.

4. "Thiokol N," which at the time of the Baruch Report appeared to offer an emergency source of tire recapping material, is not suitable for present conditions and its use is limited to a few specialties.

5. The guayule program, operated by the Department of Agriculture, had progressed by the middle of March, 1943, to the point where 53,000 acres were under lease in California and the Southwest. Less than 1,000 tons of guayule rubber are to be produced in 1943. As originally conceived, the guayule program was to make use of marginal lands, but research indicated that the normal four-year production cycle could be cut to two, if the shrub were planted in irrigated lands. Thus, the Department of Agriculture concentrated on leasing irrigated lands.

In September, 1942, there was no general expectation that, by early 1943, a nation-wide food and manpower crisis would develop, and competition between food and guayule seemed irrelevant at that time.

Conditions have changed. Food for 1943 has become more important to the Nation than a rubber insurance policy for 1946 and beyond.

As a result, I communicated with the Secretary of Agriculture stating my views that no further critical food lands be leased for guayule production, but that I would continue to support a limited guayule rubber program on lands not now devoted to critical food crops.

6. While the most important phase of the Rubber Program is the production and use of synthetics, we have not overlooked the importance of natural rubbers as an integral part of the whole rubber problem.

I found that the development of the many wild rubber programs outside of this country was badly confused, and, as a result, the Reconstruction Finance Corporation organized "Rubber Development Corporation," on which I have placed full responsibility for quick and thorough development of all such programs.

a. The Cryptostegia plantations in Haiti are showing progress, and it is expected that some production will begin in early 1944. This rubber source shows promise, and should give us some needed natural crude supplies, when the problem of proper extraction has been fully solved.

b. The Amazon Basin development in South America is being pushed with vigor and should bear some fruit in the near future. I sent a mission to this area in March and it has returned with

hopeful reports. It is a staggering program covering an area as large as the United States, in a country of low population density. The Rubber Development Corporation is working closely with the War, Navy, and State Departments and the Coordinator for Inter-American Affairs.

c. Every possible source of rubber in other Latin American countries has been examined, with areas in Mexico (for guayule and Cryptostegia), Colombia and Ecuador showing the greatest promise. These countries are working closely with us in this important effort.

PROGRESS OF SYNTHETIC PLANT CONSTRUCTION

It is expected that all plants in the synthetic rubber program will be in operation before the end of the current year.

Construction is proceeding well. In addition to those plants (of both the synthetic rubber and high-octane gasoline programs) given special directives on December 8, 1942, and February 1, 1943, all the remaining plants of both the rubber and high-octane programs have now been integrated and scheduled, to the end that component parts flow smoothly to each program, and interfere as little as possible with other important parts of the War Effort.

This, together with the basic scheduling of critical components and providing of additional fabricating facilities, which are being carried out under the direction of Messrs. Wilson and Cordiner of the War Production Board, is breaking the heretofore disastrous bottlenecks that affected our, as well as other, War programs.

At this time, of the 84 separate units making up the 48 plants in the program, 27 are in operation or ready for operation. These plants have a capacity of 252,000 long tons (30% of the program), while 14% of the butadiene and 18% of the styrene programs are in operation.

BALANCE SHEET OF RUBBER—1943

It is considered essential at all times to maintain a minimum inventory of 100,000 tons in the United States and Canada.

Because some savings have been possible against original requirements and because present estimates indicate a greater production of synthetic rubber in 1943 and a greater amount of natural crude rubber arriving from foreign countries than was indicated in my previous report of progress, the stockpile at the end of 1943 now is expected to be about 40,000 tons higher than previously estimated.

	1943
Inventory January 1	443,000
New Supplies, crude and synthetic	308,000
	751,000
Requirements	609,000
Balance December 31, crude and synthetic	142,000

APPENDIX AVAILABLE

A Statistical Appendix to Progress Report No. 3 of the Office of the Rubber Director has been prepared. This appendix consists of six charts illustrating the location and capacity of various plants in the synthetic rubber program, together with estimates of production and requirements through March 31, 1944. Copies of the Statistical Appendix may be secured by addressing a request to Kenneth Burgher, Director of Information, Office of the Rubber Director, New Municipal Building, Washington, D. C.

SUPPLY

The stockpile of crude and synthetic rubber in the United States and Canada at January 1, 1943, was 443,000 long tons, compared with its high point of 660,000 long tons in June, 1942.

It is now estimated that new supplies for 1943 will be:

Imports of natural crudes (plantation equivalent)		54,000
Buna S	218,000	
Buna N	17,000	
Butyl	11,000	
Neoprene	29,000	
	275,000	
Equal after conversion to crude equivalent		254,000
		308,000

Looking forward to 1944, all of the synthetic plants will be in production, providing over 750,000 long tons of crude equivalent. It is also expected that in 1944 at least 74,000 tons of new crude imports will be available to this country.

Production of synthetic rubbers in the first quarter of 1943 was 10,478 long tons, compared with estimates of 11,200 tons.

REQUIREMENTS

Estimates of requirements for 1943 are not much different in total, from those shown in the Second Progress Report, but differ in amounts allotted to various agencies.

	1943
Military	286,000
Trucks and busses	101,000
Passenger tires	35,000
Export, including British Empire	101,000
Canadian use—military, industrial, civilian	50,000
Other indirect military uses	36,000
	609,000

The Armed Services have cooperated splendidly in cutting to a minimum their use of rubber. As additional supplies become available, however, many uses now reduced or abandoned will be replaced.

It is not necessary to repeat the importance of maintaining a proper transportation system within this country. Due to increased burden upon all transportation facilities, the wear of bus and truck tires has been greater than anticipated, and allocations for this purpose have necessarily been increased.

The passenger car tire problem is of such importance to 25,000,000 car owners in this country that a full explanation is provided below. Provision is being made for the production of 5,000,000 new tires in 1943 and 30,000,000 in 1944.

PASSENGER CAR TIRES

There has been much confusion as to policies in connection with passenger car tires. I want to make my position clear again.

1. It is my policy to reduce, to the greatest extent possible, the restrictions placed upon the American people where restrictions are not needed or are unnecessarily burdensome. Therefore, it is no longer necessary to apply to ration boards for the recapping of tires.

Thanks to the splendid cooperation of the people and the fine work of those who organized the collection, the country now has a two-year supply of scrap rubber, enough to carry it to mid-1945, and additional supplies are becoming available every month. Recaps (camelback) are being made entirely from reclaimed scrap rubber, and no crude or synthetic rubber is used in them. However, it is sincerely hoped that some way may be found in the near future to make available enough synthetic rubber to compound with reclaim for recaps. This would greatly improve their quality and length of service, thus making the use of fabrics and manpower in this field go further.

The most important and largest inventory of rubber in existence is in the tires of passenger cars. A recappable carcass is a net saving, because a new tire need not be issued. Too much regulation or too many difficulties make people run their tires too long and the carcasses then are not recappable. They become a dead loss. Freeing recaps from rationing is a positive conservation measure which extends the life of the tires *now* on passenger cars. While some maldistribution in camelback for recapping of tires has occurred in certain parts of the country, this condition is being corrected as quickly as possible.

2. New tires will be issued only to essential drivers, that is, those drivers essential to the maintenance of production and distribution in the war effort and civilian economy. Upon the local ration boards is placed the responsibility of seeing that only essential drivers secure new tires, and that *such new tires are issued only* when existing ones are no longer usable or recappable.

3. By 1944 the country will have gone two years with less than one quarter of the normal replacement of tires and with no new cars. This accumulated deficit indicates that new tires must be provided in order to keep the country moving. Surveys show that 30,000,000 is the probable minimum replacement program that the country can get by with, even by general recapping, by maintenance of present driving speeds, and by keeping present conservation measures.

4. As passenger tire manufacture has

been all but eliminated during the past two years, it is essential that industry train new personnel in 1943, as well as put tire-making machinery back into condition for production. Unless this is done this year, the industry will be in no position to take on a program of 50% to 60% of its prewar volume, in addition to the vast production of other rubber products now being made for the war effort. Therefore it is necessary, if we are to be able to produce the minimum essential need of 30,000,000 tires in 1944, to fabricate at least 5,000,000 new tires in 1943. These, together with 7,000,000 pre-war tires now on hand, will be issued to essential drivers.

All of these steps are purely conservation measures and do not in any way imply that there is enough rubber to permit its use except when considered essential.

It cannot be denied that this country moves on rubber, and it is a military necessity to keep the country's transportation system alive. The non-essential driver cannot expect new tires for a long time, at least until rubber is no longer a critical problem, and every owner of a car must realize that conservation of tires must be strictly maintained. Driving speeds must be held down, non-essential driving reduced, and carelessness eliminated.

Rules and regulations are of little effect, if cooperation of the American people is not secured. To them, I appeal—it is their problem and theirs to help solve. Only by present-day cooperation will they provide themselves with speedier relief from the remaining burdens of rationing.

UNITED NATIONS

With most of the large rubber producing areas in Axis hands, the United States is becoming the major source of supply for the United Nations.

Very close working arrangements have been effectuated with Great Britain and the Dominions in the distribution of natural and synthetic rubber supplies.

Through the Lend-Lease Administration and the Board of Economic Warfare, the needs of other of the United Nations are being cared for.

As previously reported, I sent a Mission to Russia in December, 1942. This Mission has now returned, and a technical Mission from Russia is now in this country. Mutual benefits should accrue.

COMPOUNDING OF SYNTHETICS

Passenger car and small-sized tires made entirely from Buna S have been built and tested with satisfactory results. However, among the principal requirements are heavy duty truck, bus, and combat tires, where as much as 30% natural crudes are still necessary.

Supplementing all of the tests that have been run by Army Ordnance, and others, over the past year to prove the use of synthetics in the place of crude, we are carrying on large-scale fleet tests in an endeavor to complete the solution of the problems incident to the use of synthetics in all tires.

PATENT RIGHTS

Until recently the situation incident to after-the-war ownership and licensing of patents dealing with the copolymerization of butadiene and styrene to make Buna S rubber has been confusing. As originally set up, it was hard to realize a true community of interest between those companies who had entered into a somewhat complicated arrangement of licensing and cross-licensing, and those who, because they were on the outside, felt at a disadvantage. However, as a result of a recent voluntary offer of the Standard Oil Company (New Jersey), already followed by offers of similar tenure from three of the four rubber companies who are signatories to the present agreement, it now appears that we shall be able to look forward, in the near future, to a situation where all patents pertaining to the polymerization and manufacturing of Buna S will be interchangeable throughout their life to those who cooperate during the war in the furtherance of the Rubber Program and who join by making their own patents available to the other cooperators. It is expected that this arrangement will speed greatly the full interchange of information and the coming of the day when the quality of synthetics will surpass those of natural crude.

All such patents are royalty-free during the war, and I hope will be throughout the life of the patents.

DEVELOPMENT

The staff organization of the Office of the Rubber Director is cooperating with manufacturing organizations to make all technical information available to those who should have it. Emphasis is being placed upon the development of new knowledge which will help toward better operation of plants, greater uniformity of product, and better synthetic rubbers. In the final analysis, it is a question of improving the quality of Buna S to the point where it will be equal to or better in every respect than crude natural rubber.

Until this last objective has been attained, the use of synthetic rubbers involves (1) redesigning large size heavy duty tires to take care of the extra heat generated by the elongation and compression of synthetics; (2) using different types of carbon blacks than are used with natural crude rubbers; (3) increased milling in making certain rubbers ready for compounding; and (4) establishing new techniques incident to calendering, tubing, cementing, vulcanizing, etc., in the manufacture of rubber products. As a result, without waiting for expected improvements my organization is working closely with industry to solve these problems and to impart to all rubber manufacturers the best techniques.

Industry, large and small, is meeting, exchanging information, and dividing up the work that must be done. Selfish interests must be subordinated to the needs of the program. Great progress is being made, and as more synthetics are made available for factory runs of typical products, the results of these efforts are showing encouraging results.

Present findings of the Army, based on results obtained with its test fleets, are that, because of the heat generating characteristics of Buna S, it will be necessary to use rayon instead of cotton cord in the carcasses of most large size heavy duty and combat tires. Many experts feel that this will also be necessary for large size heavy duty truck and bus tires.

In consequence of all the above, there has been or will be expansion (1) of the rayon tire cord producing facilities of the country, (2) of plants for the making of special carbon blacks, and (3) of certain rubber factory equipment. All of these are necessary corollaries to the synthetic rubber manufacturing program. They are receiving a great deal of attention and it is hoped that they will be brought through in time.

ORGANIZATION

Due to the efficiency of the entire staff working with me on this vast program, it has been possible to reduce personnel and to release office space.

It has been a source of satisfaction to see an organization of operating, technical, and construction men blend together and work so efficiently in so short a time.

W. M. JEFFERS.
Rubber Director.

May 17, 1943.

Charge Price Discrimination

The U. S. Rubber Co. and the Hood Rubber Co., the latter a subsidiary of the B. F. Goodrich Co., were charged by the Federal Trade Commission on May 31 with price discrimination between purchasers of their respective products. According to the charges, U. S. Rubber gives a 5% discount on make-up orders shipped in lots of 480 pairs or more to small retailers, 10% discount to large retailers, and 17.7% discount to large chain customers, while Hood gives larger discounts to chains, mail order houses, department stores, etc., than it does to small retailers. The effect of this "discrimination" has "lessened competition" in the sale of rubber and canvas footwear, according to the FTC. Annual sales of footwear of U. S. Rubber is reported to aproximate $20,000,000 and Hood, $16,500,000.

Nesbit Elected President

Jean H. Nesbit, who has been acting as executive vice-president of the U. S. Rubber Reclaiming Co., Inc., since the passing of the late Louis Plumb, was elected president and treasurer of that company at a meeting of the board of directors, held in New York City on May 25.

NEW EQUIPMENT

Electronic "Sewing" Machine

An electronic "sewing" machine that uses radio-frequency current instead of needle and thread to join plastic materials has been developed by the RCA Victor Division of the Radio Corporation of America, Camden, N. J. The new device, still in the developmental stage, but with tremendous post-war possibil-

ities, works on thermoplastics and thermoplastic coated fabrics, handling such materials as Koroseal with ease. It "stitches" a thin solid seam that is air and water-tight, creating a bond which is said to be stronger than the material itself, accomplishing this with such simplicity and ease that it promises to overcome many fabrication difficulties involved in conventional processing methods as applied to thermoplastics.

The radio sewing machine was created to meet a definite need in the sheet plastics industry. Thermoplastics, tough resilient material, can be rolled into large cloth-like sheets or can be used to form an air and water-tight coating on standard fabrics. When cut into patterns, the sections are usually put together by sewing with thread, by cementing, or by fusing with externally applied heat. None of these methods has been found to be entirely satisfactory. Heat fusing has always appealed as the most desirable method. The hot-iron methods which have been employed, however, have proved far from satisfactory for many applications because of the difficulty in maintaining uniform temperatures, because the materials stick to the heating plates, and because the materials tend to extrude when pressure is applied. By generating heat inside the material itself and by using a minimum of pressure, RCA's electronic sewing machine is reported to eliminate these difficulties.

The material to be sealed, or "sewed," is fed across a table top through two small rollers which serve as the "needle." A small radio frequency generator is connected to these rollers. As they pull the material along, they cause a concentrated beam of radio frequency current to pass through the material. Heat is generated by a dielectric loss, or, in other words, by the struggle of the current to get through the closely packed molecules of matter which compose the material. The heat, together with a very light pressure, causes thermoplastics to fuse, or weld, in a tight bond.

Somewhat similar in appearance and operation to the

RUBBER ★ SYNTHETIC RUBBER ★ PLASTICS

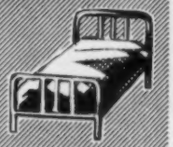
THE Schuster MAGNETIC CALENDER GAUGE SAVES THAT MATERIAL

For upwards of 15 years, the Schuster Magnetic Calender Gauge has unerringly set rubber calender rolls to a predetermined thickness and correctly maintained that thickness. It has saved the time of hand-miking, eliminated human error, saved the stock sampled for calender tests, and assured uniform thickness in the finished product.

All this, *at the right time—before* damage is done. And *continuously*—the only way worth while.

The instrument is simple in design . . . rugged in construction . . . practically without wearing parts . . . adjustable to any thickness. Originally used for rubber, it has taken over just as deftly for synthetic rubber, plastics, cellulose, and other media. No matter what the article, your coating must be thick enough, but not even 1/1000" too thick, or the war effort suffers irreparable loss. No matter what the material, you've got to s-t-r-e-t-c-h it as far as possible—and "possible" daily proves to have a new, elastic meaning.

Better investigate the Schuster Magnetic Calender Gauge at once, with or without automatic control. Every installation has to be engineered to the job . . . Please *give us time to do it right.*



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Improve the tack WITH

CRYSTEX insoluble SULPHUR

Crystex, an amorphous sulphur, improves the tack by preventing bin-cure and dryness which usually occur when a high percentage reclaim compound is used.

Crystex prevents bloom in uncured rubber stocks. It does not dissolve in rubber but will "stay put" at temperatures usually prevailing during storage periods. Crystex is of outstanding value when employed in the manufacture of stocks to be used for repair materials, in retread stocks, valve-patch frictions, and other products.

The characteristics of Crystex indicate that further uses may be found for this product in the rubber making industry.

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Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
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NORTH PORTLAND, OREGON
HOUSTON, TEXAS APOPKA, FLORIDA

conventional sewing machine, the electronic device derives its heating current from a low-power oscillator. A small electric motor with foot pedal control drives the rollers. Ordinary alternating current of 110 volts supplies the power for both the motor and the oscillator.

Laboratory tests are said to have revealed the electronic machine as an effective instrument for the handling of such thermoplastics as Vinylite, Koroseal, and Pliofilm. All three of these materials are being used in a widening field of practical applications. Other methods of applying the same general principle to the problems of fabricating thermoplastics are under development in RCA Laboratories. It is possible, for instance, to use specially arranged electrodes in presses to seal the seams of a garment, or other product, in a single quick operation.

Taylor Booster Relay Air Valve

The Taylor Booster Relay Air Valve, an auxiliary device which provides accelerated valve action to eliminate the effect of lag in large diaphragm motors and/or in long air lines between controlling instruments and diaphragm motors, has been added to the line featured by the Taylor Instrument Cos., Rochester, N. Y. Under these difficult conditions, the relay air valve will inflate or deflate the largest Taylor valve motor (diaphragm of 144 square inches) from five to seven times faster than by controller alone. Installed in the air line

adjacent to the diaphragm motor it actuates the diaphragm valve by means of an independent air supply of 25 to 150 p.s.i. which is applied or relieved through large ports. This action is in direct proportion to controller output. The ratio is 1 to 1. Process stability is increased by causing valve action to closely follow controlling instrument output changes. Required set points can be maintained on those applications where time lags and capacities are small (rapid process reaction rates).

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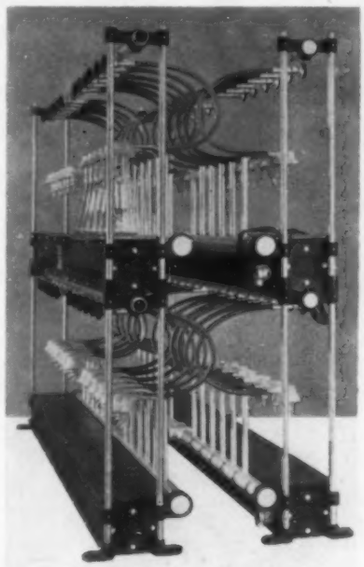
COLITE—"The Mold Lubricant"

Extraction Rack for Chemical Analysis

Utilizing extraction condensers, as specified in A.S.T.M. Designation D297-41T for the chemical analysis of rubber products, the multiple unit, electrically-heated extraction rack seen in the accompanying photo-



graph has been developed by the Precision Scientific Co., 1750 North Springfield Ave., Chicago, Ill., for routine extractions incident to the production of synthetic rubber.

The multiple assembly pictured, consisting of 48 extraction units, is composed of two sets of 24 units each, arranged back-to-back—each set composed of two banks of 12 units each, one deck above the other. Overall dimensions of the 48-unit assembly is only 48″ long, 24″ wide, 39″ high.

Water supply and discharge manifolds serve the extraction condensers, the water supply to each condenser being controlled by a needle valve. Condensers conform to A.S.T.M. Method D297-41T. They can be used with 250 or 400 ml. flasks, and are spaced on 3⅜″ centers. To permit elevation of each condenser for placement or removal of the flask, the condenser overflow pipe telescopes into a vertical pipe communicating with the water discharge manifold, while the connection between condenser inlet and water supply valve is flexible synthetic rubber tubing.

Electrically-heated hot plate tops are heat-treated, heavy cast iron, with strip units fastened to the underside, and the remaining space within the hot plate housing packed with thermal insulating material to promote heat efficiency. Each hot plate includes a 3-heat switch.

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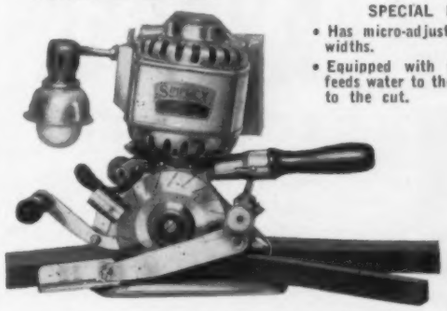
RUBBER STRIP CUTTER
PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.



SPECIAL FEATURES
- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion-induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Can be used to trim conveyor belts, cut sponge, pure gum, uncured stocks, etc. Cuts squarely—no rejects.

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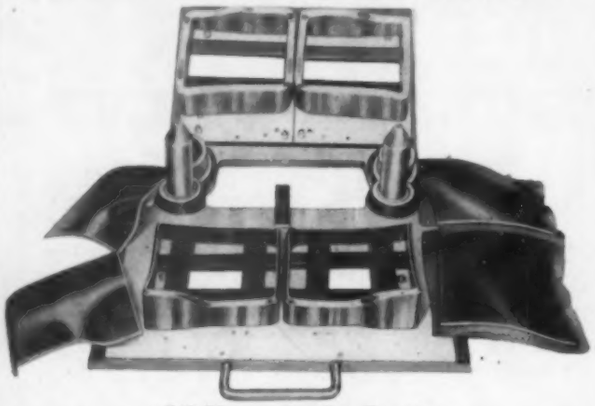
SHARP EDGE CUTTING DIES

Also TOOLS, DIES, JIGS, FIXTURES
MACHINE PARTS and SPECIAL MACHINERY



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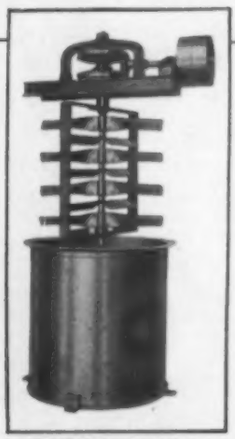

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ROBINSON "Unique" Equipment for processing scrap vulcanized, hard and synthetic rubber or for the preparation of rubber cement is time-tested and performance-proven! Robinson engineers will make recommendations to meet your particular requirements. —*WRITE TODAY!*

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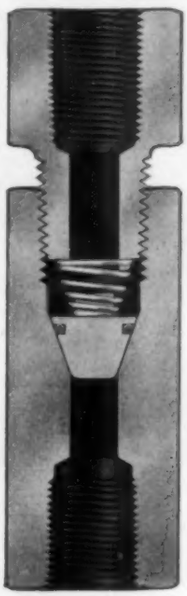
High Pressure Check Valve

A high pressure check valve that permits a larger passage of fluids or gases, yet gives instant leak-proof shut-off at all pressures up to 25,000 pounds per square inch and operates in any position, has been developed by Martin-Decker Corporation of Long Beach, California. While particularly designed for all high pressure work, the valve nevertheless unseats at the slightest pressure, an important feature where initial low pressures are encountered. The instant fluid or gas flow reverses from the desired direction, the valve snaps shut and increased pressure only causes a tighter sealing of the valve, preventing leakage in either direction and completely closing off reverse flow. Internal parts consist simply of a valve with integral packing ring and spring. All machined parts are accurately made for perfect fit and are extremely sturdy and durable. Construction is such that the valve can be easily taken apart with only a wrench whenever required. Packing rings will handle a wide variety of fluids or gases.



Recording Air-Operated Controller

A new instrument, known as a recording air-operated controller, which incorporates in a single instrument all the equipment needed to automatically control the temperature in polymerizers used for polymerization of butadiene and copolymers such as stvrene or acrylonitrile, has been developed by the Bristol Co., Waterbury, Conn. The instrument automatically controls the complete polymerization process, including the heating and cooling cycles and is designed to eliminate overshooting of the control point as the temperature reaches the control setting, as well as control the temperature at the desired value during the reaction cycle. It is designed particularly for the special polymerizer reactors.

VULPRENE

Replacement for Crude and Reclaimed Rubber

VULPRENE is the generic name for a series of long-chain polymers, similar to Norepol, and derived from fatty oils. They are available in various forms, from viscous through tough rubber-like vulcanizates, and are suitable as replacement materials for crude and reclaimed rubber in insulation, coating and molded goods where extreme flexibility, tensile and abrasion are not required. They can be compounded, milled and vulcanized in the usual manner.

Other Products for Use as Replacements, Modifiers and Extenders for Latex, Reclaims and Synthetics

RESIN AND LACQUER EMULSIONS—These emulsions are being used today as *Latex Modifiers* and *Complete Latex Replacements* to extend, thicken, stabilize, increase penetration, improve resistance to acids, oils and solvents; in *Coatings* to produce adherent pigmented or clear coatings on paper, fabric, and rubber and as intermediate coats for lacquer on rubberized cloth; in *Rubberizing* textiles; in *Latex Treated Papers* to increase strength and improve ageing; in *Adhesives*, for paper, for leather to cloth, and cloth to cloth.

VULPRENE SOLUTIONS AND DISPERSIONS. These forms of Vulprene are being used for adhesive tapes, marking papers, water-resistant coatings, etc. *Vulprene Latex* is used as a latex extender particularly as shoe adhesives, for impregnation of paper, can sealing compounds and coating materials.

ALKYD 18—an alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex in coating, combining and impregnating process.

EMULSION 58-8—a series of emulsified elastomers containing up to 65% solids. Recommended for use as full latex replacements in impregnation and combining.

PIGMENT BASES—concentrated aqueous dispersions of pigments in resin bases, available in all shades and viscosities, suitable for spreading, spraying, etc.

Also Acrylic, Vinyl, Maleic, Phenolic, Hydrocarbon, Ethyl Cellulose, Cellulose Acetate and Nitrate emulsions and solutions for various applications.

WE'RE SORRY!—We have received so many inquiries in recent months for data and samples of our products that it has not always been possible to acknowledge them promptly. If you have not received a reply, please bear with us and we'll try to answer your request as soon as possible.

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Rubber Substitutes • *Rubber Synthetics* • *Resin, Lacquer Emulsions*

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Factory Branches: Newark, N. J. and Chicago, Ill.

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LEAD PEROXIDE
90%
of interest to processors of
Synthetic Rubber

Test samples will be supplied upon request. Write to Executive Offices of

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New Greatness for the Rubber Industry

1908
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We predict that the next five years will record more progress with rubber than was recorded in the achievement-filled thirty-five years just passed.

Plussed by present experience, we believe our experience as engineers to the rubber industry will enable us to make important contributions toward this new greatness.

We believe that new concepts should be carried along toward commercial realities now, and we invite the opportunity to engage with you in this objective.

Presently, precision gages, jigs, form tools, and molds may be an immediate requirement. If so, their design and production are our Victory-effort engagement.

GO PRECISION AUTHENTICATORS NO-GO

ELECTRIX Corporation

Peace-time engineers of soft-rubber connectors for electrically-operated equipment

150 MIDDLE ST., PAWTUCKET, R. I.

REVIEWS

BOOKS

Industrial Chemistry. (4th Edition). By Emil Raymond Riegel. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y. 6 x 9 in. 861 pp. $5.50.

The general scheme of this latest edition of *Industrial Chemistry,* which is an authoritative, readable treatise surveying all the important processes and practices of more than fifty key industries in which chemistry plays an important part, is practically unchanged from the previous edition, published in 1937. Several chapters have of course been completely rewritten while many others have been changed, corrected and amended to bring them up-to-date. The chapter on rubber, for example, includes the developments in synthetic rubber, as well as the latest advances in working natural rubber.

The chapter on rubber, which was written in close collaboration with Raymond B. Stringfield, well known consulting chemical engineer of Los Angeles, is typical of the treatment given to the diversity of materials covered by the book. It treats with the discovery of rubber, the growth of the plantation industry, development of vulcanization (the credit for which is granted to Luedersdorff, Hayward, Goodyear and Hancock), compounding and compounding ingredients, stock preparation, and numerous rubber products, including tires and tubes, belting, garden hose, gaskets, flooring, hard rubber, cements, sponge rubber, and reclaimed rubber.

Like the other chapters in the book, the one on rubber has a brief appendix listing the more important patents of the industry, outlining a few problems, and giving a list of reading references. In all, the book has 50 chapters, a carefully cross-referenced index, tables on chemical elements, conversions, diesel fuel standards, and data on chemical and allied manufactures. The latest edition of this work is not only of value to the student and the teacher, but serves as a complete refresher course in industrial chemistry for chemists, physicists, engineers, and technical and scientific workers in general.

•

The Amazon: The Life History of a Mighty River. By Caryl P. Haskins. Published by Doubleday, Doran & Co., Inc., Garden City, N. Y. 6 x 9 in. 415 pp. $4.00.

A general picture of the Amazon Valley, largest of the earth's watersheds, and of those portions of the South American continent which it drains, is given in this new book. The author first speculates on the formation of the land in the primeval past, traces the course of the mighty river from source to mouth, describes the geography, the jungle flora, the Indian tribes, the growth of the Inca empire, the Spanish and Portuguese conquests, and finally tells the story of rubber, with which the history of the Amazon is so closely entwined. All of this is accomplished in what might be called the first section of the book, the second and larger section being devoted to details of the political history of the six countries fed by the river: Venezuela, Colombia, Ecuador, Peru, Bolivia and Brazil.

GRANULATED CORK
FOR EXTENDING RUBBER
SOUTHLAND IRON & METAL COMPANY
P. O. BOX 868 CORK DIVISION NORFOLK, VA.

The story of rubber (Chapter XV) is factual and well told, from the earliest record of the re-discovery of latex by Charles Marie de la Condamine in the eighteenth century to the current revival of interest in South America as a result of the Japanese conquests in the Far East. The author carefully traces the development of the early rubber manufacturing industry which led to the rubber boom in the Amazon Valley and the slow but steady growth of the plantation industry in the Far East which killed off the South American trade. Reasons for the failure of the many attempts to establish plantations based on scientific methods of cultivation in the Valley are outlined. Because of the importance of South America to our overall war effort and current interest in our neighboring republics, we believe members of the rubber industry will find this book of exceeding interest.

•

1943 Chemical Formulary. Edited by H. Bennett. Published by the Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N. Y. 5½ x 8½ in. 640 pp. $6.00.

The latest edition of this work—the sixth to be published—broadens and brings up-to-date the contents of the five preceding volumes. Special elementary formulae of direct and indirect military interest have been included, while a chapter on substitutes (including rubber substitutes) has been added. The simple introductory chapter of general directions and advice, which is of value to mature users of the book who have not had previous training or experience in the art of chemical compounding, has been repeated, and a directory of sources of chemicals and supplies has been added.

Products covered in this latest edition of chemical formulae include: Adhesives; Beverages; Cosmetics and Drugs; Emulsions; Farm and Garden Specialties; Food Products; Hides, Leather and Fur; Inks and Marking Materials; Lubricants and Oils; Materials of Construction; Metals, Alloys and Their Treatment; Paint, Varnish, Lacquer and Other Coatings; Paper; Photography; Polishes and Abrasives; Rubber, Resins, Plastics and Waxes; Soaps and Cleaners; and Textiles and Fibers. A subject index is included.

•

Manual of Laboratory Glass-Blowing. By R. H. Wright. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N. Y. 5½ x 8½ in. 90 pp. $2.50.

Because it is now possible to buy many laboratory glass items that formerly had to be individually made, the laboratory glass-blower these days is more often called upon to produce special apparatus for special purposes. The operations described in this book reflect this change. The author gives a short and non-technical account of the materials—glass and gas—used by the glass-blower, describes the tools required for ordinary work around a physical or chemical laboratory, and outlines the fundamental operations.

•

Catalog No. 427 recently issued by the F. J. Stokes Machine Co., Philadelphia, describes and illustrates the company's *semi-automatic toggle-type compression presses* for the plastics industry. The new and improved "Standard" line of presses from 20 to 300-ton capacity is also shown.

Do Your GR-S Synthetic Rubber Stocks Lack Building Tack?

Try ESTAC—the factory-proved TACKIFIER for this type of synthetic rubber. Readily available.
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PLASTICIZERS FOR SYNTHETIC RUBBER.

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GR-S Synthetic Rubber Softener

*REG. U.S. PAT OFF.

● NEVOLL*, a coal-tar softener, is finding considerable use as a softener and plasticizer for the new GR-S (Buna S) synthetic rubber.

● It meets the Rubber Reserve Company's Contract Specification for coal-tar softener dated Nov. 21, 1942.

● NEVOLL* is currently quite readily available for prompt shipment in tank cars and drums.

Ask for a sample and further information from us or our agents

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Chemicals for the Nation's War Program

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REVIEWS (CONT'D)

Essentials of Industrial Health. By Dr. C. O. Sappington. Published by J. B. Lippincott Co., East Washington Square, Philadelphia, Penna. 6 x 9 in. 626 pp. 63 ill. $6.50.

Although absenteeism is the primary headache of the large manufacturing organization, the billions of man-hours lost annually from illness and injury, set at 400,000,000 man-days, is no less a problem. It is estimated that if a reduction of 10% could be made in time lost annually through such causes it would represent the time required to build five capital ships, 16,000 tanks, or 9,000 bombers. The problem is accentuated in war-time, and this book, therefore, which is an exhaustive treatise, is most timely and welcome.

The application of preventive medicine and public health to industry is the subject matter of the book, which is divided into three parts: (1) Industrial Health Administration; (2) Industrial Hygiene and Toxicology; and (3) Industrial Medicine and Traumatic Surgery. There are 15 chapters in all, appendices, a list of references, an index of proper names, and a cross-referenced subject index. In view of the fact that the war can and will be won on industrial assembly lines, this book on industrial health can truly be termed a contribution to the war effort.

•

Glue and Gelatin. By Paul I. Smith. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N. Y. 5½ x 8½ in. 192 pp. $3.75.

This book caters on broad lines for all branches of the glue and gelatin industry—raw materials, manufacture and application. It was planned and written more as a primer for the practical man than as an enlightened and original book for the research chemist, although the latter will also find it of interest. It has 15 chapters in all and a subject index.

BOOKLETS, CATALOGS, Etc.

Crisis in Rubber. B. F. Goodrich Co., Akron, Ohio. 8½ x 10¾ in. 16 pp.

The status of natural and synthetic rubber and the accomplishments made to date to meet the most crucial situation that has ever confronted this nation are reviewed in this interesting brochure. Covered, in order, are wild rubber, plantation rubber, domestic rubber, and synthetic rubber, with special emphasis on the latter. A glossary of synthetic rubber terms is included, while a chronology of the development of synthetic rubber since 1937 is furnished in the form of a small pamphlet. Of special interest is a table giving the relative properties of natural and synthetic rubbers, both physical and chemical.

WAX FINISHES FOR RUBBER GOODS!

Easy to apply, water-repellent, non-flammable, Johnson's Wax Finishes are valuable allies for the manufacturer of rubber goods. They retard oxidation, the destroyer of rubber, and add a lustre which improves the appearance of the finished products.

Application may be made by dipping, spraying or wiping. Johnson's Wax Finishes cover 2,000 feet or more per gallon. Available in 5 and 55 gallon drums.

For samples and further information write

S. C. Johnson & Son, Inc.
Industrial Wax Division—Dept. RA-63
RACINE, WISCONSIN

Buy United States War Bonds and Stamps

Perbunan: Compounding and Processing. (2nd Edition). Stanco Distributors, Inc., 26 Broadway, New York, N. Y. 8½ x 11 in. Looseleaf.

The second edition of this compounding and processing manual is a decided improvement over the first one, issued in April, 1942, and reviewed in the June, 1942, issue of RUBBER AGE. In the first place it naturally contains a good deal more technical data, based on new information secured as a result of practical compounding, and in the second it is divided into sections, separated by tab sheets, so that any desired information may quickly be located.

There are nine sections in the new manual, as follows: Processing; Softeners; Fillers and Pigments; Accelerators; Mixtures with Rubber and Other Polymers; Resistance to Solvents, Oils and Petroleum Fuels; Resistance to High and Low Temperature; Miscellaneous Properties; and Product Compounding. In addition, there is a short discussion on the basic compounding of Perbunan.

The new edition also contains a special section on the compounding and processing of GR-I (Butyl), the disclosure of which is now permitted by the U. S. Patent Office modification of the existing secrecy order, although distribution of the information is carefully controlled.

•

Sterling: A Semi-Reinforcing Furnace Black. Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 8½ x 11 in. 32 pp.

The characteristics of Sterling, the new semi-reinforcing furnace black, now being produced at the rate of approximately 75,000 pounds per day, with this production to be more than doubled within the next several weeks, in natural rubber and GR-S (Buna S) are compared with those of other carbon blacks, including semi-reinforcing furnace, easy processing channel, and medium thermal types, in this technical bulletin. The results of a wide variety of tests made for a range of cures and for a range of loadings are given in concise, graphical form. Data on tensile, modulus, elongation, hardness, tear resistance, rebound, compression set, and heat generation is included. Additional data on aging and heat embrittlement is also given.

•

Thermosetting Vinyl Butyral Spreader Coatings. Plastics Division, Carbide and Carbon Chemicals Corp., 30 East 42nd St., New York, N. Y. 8½ x 11 in. 6 pp.

As indicated by the title, this bulletin contains technical data on vinyl butyral spreader coatings which now, replace rubber in many applications. The folder contains data on formulations, primer coating, pigments, plasticizers, finish coats, solvents, baking, calendering, and cementing. These coatings are unaffected by alcohol and acetone and tests indicate they will resist boiling water. The resins lend themselves to use on standard spreading equipment.

•

Battery Service Manual. Association of American Battery Manufacturers, Inc., First-Central Tower, Akron, Ohio. 8½ x 11 in. 40 pp. 25c.

This new manual, which is simply written and profusely illustrated, is intended as a hand book for battery manufacturers, service men, salesmen, and consumers. It covers battery construction, operation of batteries, capacity, stock maintenance, installation, proper charging, and similar angles of battery manufacture and maintenance.

•

Kalvan in GR-S and GR-I. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 8½ x 11½ in. 8 pp.

The use of Kalvan, a mineral filler, in GR-S with or without blacks for building tack, in GR-S (non-black) compounds for good tensile properties, in GR-I with carbon blacks, and in GR-I (non-black) stocks for good tensile properties, is covered in this laboratory report. Test data on tensile properties, Shore hardness and tear resistance is given in each case, with additional results indicated for the particular compounds used.

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Producer in Mexico of
GUAYULE RUBBER
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Formerly Distributed By
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GAMMETER'S
ALL STEEL ALL WELDED
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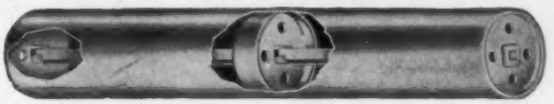
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Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.
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ROSIN OIL
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CARTER BELL
1903
RUBBER SUBSTITUTES
Springfield New Jersey

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, JUNE 14, 1943

Crude Rubber

THAT no possible source of crude rubber is being overlooked in the current emergency was evident in a recent report issued by the Department of Agriculture outlining steps which have been taken to increase the scope of the goldenrod program, on which the late Thomas A. Edison pinned so much faith. Additional acreage is being planted to goldenrod this year and the largest harvest in years is anticipated. In keeping with this phase of the program, an intensive study has been launched on the handling of rubber from goldenrod so that every ounce harvested may be put to possible use.

The program on *kok-saghyz* is also being enlarged. The latest report on the rubber yield from this Russian plant comes from the Experimental Farm maintained at the Klamath Project in the California-Oregon area. A trial plot of about 2,000 square feet planted to *kok-saghyz* last year produced a yield of approximately 50 pounds of rubber per acre. Careful breeding and selection is expected to increase this yield substantially. Increased yield from guayule is also anticipated as a result of some recent developments at Salinas, California.

In the meantime, the Latin American countries, paced by Brazil, continue to extend their activities on the collection of wild rubber. The month of June has been declared as "Rubber Month" in Brazil while in an effort to increase the number of workers migrating to the jungle rubber areas all rubber workers have been granted an exemption from military service. The lack of shipping facilities in Brazil is reported to be holding up the migration program, with hundreds of tappers signed up for the program idling at various points waiting for such transportation.

Prices shown below are those set by the Rubber Reserve Company:

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X	22½	40
Thick Pale Latex Crepe, 1X	22½	40
Thin Pale Latex Crepe, 1X	22½	40
Thick Brown Crepe, 1X	21⅜	38⅞
Thin Brown Crepe, 1X	21⅜	38⅞
Thick Remilled Blankets, #1	21⅜	38⅞
Rolled Brown or Flat Bark	18	35½
Smoked Blankets, #1	21⅛	38⅝
Claro Brand 1XRSS	22½	40
Sole Crepe Trimmings	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Curde	15	29
Cut Fines, Crude	15½	29¾
Cut Fines, Washed & Dried	22½	40
Upriver Coarse, Crude	12⅝	26⅛
Upriver Coarse, Washed & Dried	20¾	37¾
Caucho Ball, Crude	11⅜	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17½	31
Less than Carload Lots	18	31½
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¼	23¼
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¼	44¼
Centrifuged, Tank Car Lots	27¾	45¾
Heat-Concentrated, Carload Drums	29½	47

C, for Civilian Use; N-C, for Non-Civilian Use.

Scrap Rubber

There have been several indications in recent weeks that the scrap rubber supply is quite healthy and will continue so for a long time to come. These indications included the reduction in the price of scrap from $25.00 to $15.00 a ton, instructions to local salvage agents to discontinue their efforts on the collection of scrap, and official WPB orders to the effect that tire carcasses which can be made reusable by the application of reliners, or other repair materials, be excluded from the scrap now being processed by the reclaimers. Prices shown below are ceilings on typical grades of scrap rubber:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$18.00
Beadless truck tires	ton	24.00
Mixed truck tires	ton	18.00
Beadless passenger tires	ton	24.00
No. 1 passenger peelings	ton	47.50
No. 1 truck peelings	ton	47.50
No. 2 passenger tubes	lb.	.07¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05⅝
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41
CHAFERS			
Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 7.818
40x40	36 in.	6.15	lb.	—	@ 6.991
40x36	36 in.	6.50	lb.	—	@ 6.615
48x48	40 in.	2.50	lb.	—	@16.200
48x48	40 in.	2.85	lb.	—	@14.210
56x60	40 in.	3.60	lb.	—	@11.944
48x44	40 in.	3.75	lb.	—	@11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

The price of middling uplands on the Cotton Exchange has swung in the narrow range of 34 points in the past month. High for the period was 22.16 on May 25 and low was 21.82 on May 17, the first day of the period. The average price of middling uplands for the month of May was 21.93, based on 25 trading days. At no trading point during the period was there any spectacular rise or fall in the price, the trade moving cautiously in the face of repeated reports of an early Allied invasion of Europe and rumors of peace feelers extended by various European countries, particularly Italy and Roumania. A slight flurry occurred in mid-May, when the price advanced steadily a few points a day until it reached the high point of the period on May 25, but hedging and liquidations brought it down again. It has hovered around the 22-cent mark for the past several days. Cotton consumption during May declined slightly from May of last year. Quotations for middling uplands on the Exchange follow:

	May 15	June 14		
	Close	High	Low	Close
July	19.74	20.26	20.17	20.21
October	19.50	19.87	19.79	19.83
December	19.38	19.67	19.61	19.64

Reclaimed Rubber

Demand for reclaim continues at the high level set in recent months, paced by the requirements of camelback, now offered without restrictions to essential motorists. Foreseeing the time in the near future when the availability of synthetic rubber will occasion its use in recapping material, reclaimers are generally experimenting with production technique, which may have to be modified, to meet the problem when it arises. Considerable advances in methods of reclaiming the synthetics are also reported, although the best procedure for segregating blended products has not yet been discovered. Prices shown below are ceilings on typical reclaim grades:

Shoe				
Unwashed	lb.	.07	@	.07¼
Tube				
Black Tube	lb.	.11¼	@	.11½
Red Tube	lb.	.12	@	.12¼
Tires				
Black (acid process)	lb.	.07½	@	.07¾
Black, selected tires	lb	.06½	@	.06¾
Truck, Heavy Gravity	lb.	.08½	@	.08¾
Miscellaneous				
Mechanical blends	lb.	.04½	@	.05½
White	lb.	.13	@	.13¼

Ducks

Enameling (single filling)	lb.	—	@	.44¼
Belting and Hose	lb.	—	@	.39
Single filling, A grade	lb.	—	@	.19¼
Double filling, A grade	lb.	—	@	.20¼

FROM THE TINIEST TO THE LARGEST

● Eastern mixers provide proper blending in 100,000 barrel storage tanks such as shown above. The laboratory stirrer shown at the right is also an Eastern product. No other manufacturer provides such complete coverage of any and all mixing problems, from a 1/1000th H. P. laboratory stirrer to 150 H. P. of mixing per tank.

For *all* mixing jobs, both specialized and regular, the *right* equipment can be furnished by Eastern. Eastern's experience will solve *your* mixing problem, whether you need large or small, standard or special mixers.

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● Years of experience making dies of all kinds for rubber manufacturers enable us to offer you correctly designed dies of tempered steel which retain their cutting edges....*Send blue print for quotation.*

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CUTTING AND PERFORATING DIES

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COLORS for RUBBER

Red Iron Oxides
Green Chromium Oxides
Green Chromium Hydroxides

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Reinforcing Fillers and Inerts

C. K. WILLIAMS & CO.

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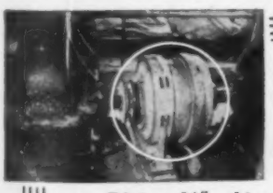

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CLUTCH - BRAKE COMBINATIONS

This 24" diameter STEARNS Magnetic clutch and Brake Unit is providing smooth start and positive stop on a rubber mill in a prominent mid-western plant. Efficient, economical and safe, sizes and combination to meet requirements. Write for bulletin 225.

If you have a tramp iron problem ask for our Bulletin 301 on Magnetic Pulleys, improved, air-cooled, latest design. Sizes to fit your conveying system or self contained unit.

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RMP ANTIMONY

• ATTRACTIVE
• NON-DETERIORATING

for RED RUBBER

RARE METAL PRODUCTS CO.
BELLEVILLE, N. J.

CHEMICAL MARKETS

New York, June 14, 1943
All Prices F.O.B. Works

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.28 @	.33
A-10	lb.	.36 @	42
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.60 @	.70
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.43 @	.45
Beutene	lb.	.59 @	.64
B-J-F	lb.	.38 @	.43
Butyl Zimate	lb.	— @	1.13
Captax	lb.	.38 @	.40
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.36
El-Sixty	lb.	.40 @	.47
Ethyl Zimate	lb.	— @	1.13
Ethylidine aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.34 @	.39
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Ledate	lb.	— @	1.48
Methyl Tuads	lb.	— @	1.53
Methyl Zimate	lb.	— @	1.23
Monex	lb.	— @	1.53
Pentex	lb.	.74 @	.84
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.65
R & R 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	1.55 @	1.70
Rotax	lb.	.48 @	.50
Safex	lb.	1.15 @	1.25
Selenac	lb.	— @	1.25
SPDX	lb.	.70 @	.75
Super-Sulfur No. 2	lb.	.13 @	.15
Thiocarbanilid, drums	lb.	.28 @	.33
Thiurad	lb.	— @	1.55
Trimene	lb.	.54 @	.64
base	lb.	1.03 @	1.18
Triphenylguanidine	lb.	.45 @	—
Ulto	lb.	1.25 @	1.75
Ureka	lb.	.50 @	.75
Blend B	lb.	.50 @	.57
Blend C	lb.	.48 @	.55
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—
Inorganic			
Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)			
Blues [b]			
Prussian	lb.	.36 @	—
Ultramarine	lb.	.17 @	.27
Browns [b]			
Mapico	lb.	.1135@	—
Umber, Turkey	lb.	.04¾ @	—
Greens [b]			
Chrome	lb.	— @	.25
Guignet's Green	lb.	.70 @	—
Reds			
Antimony			
crimson, 15/17	lb.	— @	—
sulfur, free	lb.	— @	—
Indian	lb.	.08¾@	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.096 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¾ @	—
Whites [b]			
Cryptone No. 19	lb.	.0560@	.0585
Cryptone CB No. 21	lb.	.0560@	.0585
Cryptone ZS-800	lb.	.0825@	.0850
Lithopone:			
Albalith	lb.	.04¼ @	.04½
Astrolith	lb.	.04¼ @	.04½
Azolith	lb.	.04¼ @	.04½
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¼
Titanox A	lb.	.14½ @	.14¾
Titanox B	lb.	.05¾ @	.06
Titanox C	lb.	.05½ @	.05¾
Zinc Oxide—American Process [b]			
American Azo:			
ZZZ (lead free)	lb.	.07¼ @	.07½
Anaconda, lead free	lb.	.07¼ @	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼ @	.07½
XX Red—4	lb.	.07¼ @	.07½
XX Red—72	lb.	.07¼ @	.07½
XX Red—103	lb.	.07¼ @	.07½
Kadox, black label—15	lb.	.07¼ @	.07½
Red label—17	lb.	.07¼ @	.07½
St. Joe, black label	lb.	.07¼ @	.07½
green label	lb.	.07¼ @	.07½
red label	lb	.07¼ @	.07½
U. S. P.—7, bbls.	lb.	.10½ @	.10¾

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½ @	.09¾
Green seal—8	lb.	.09 @	.09¼
Red seal—9	lb.	.08½ @	.08¾
Yellows [b]			
Cadmolith	lb.	.55 @	.60
Chrome	lb.	— @	.50
Mapico	lb.	.071 @	—

BLACKS
(In bags, carload lots)

Aerfloted Arrow	.0355@	—
Certified	.0355@	—
Certified Spheron	.0355@	—
Channel "S"	.12 @	—
Continental	.0355@	—
Disperso	.0355@	—
Dixiedensed	.0355@	—
Dixiedensed 66	.0355@	—
Excello	.0355@	—
Furnex	.03½@	.06
Furnex Beads	.03½@	.06
Gastex	.03½@	.06
Kosmobile	.0355@	—
Kosmobile 66	.0355@	—
Kosmos-Dixie 20	.03½@	.06
Micronex (Amarillo)	.0355@	—
Micronex Beads (Amarillo)	.0355@	—
Pelletex	.03½@	.06
P-33	.0475@	—
Shell Carbon (Del. Midwest)	.025 @	—
Sterling	.035 @	—
Supreme	.0355@	—
Thermax	.0225@	—
Thermax "S"	.0675@	—
Wyex	.0355@	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00	@24.50
99½%-300	ton	—	@16.50
86-90%-300	ton	—	@13.50
Asbestine	ton	16.50	@20.00
Atomite	ton	—	@27.50
Barium carbonate (98-100%)	ton	47.00	@49.00
Barytes	ton	25.35	@36.00
Bentonite	ton	11.00	@16.00
Blanc fixe, dry	ton	60.00	@67.50
Calcene	ton	37.50	@43.00
Catalpo (fact)	lb.	.02 @	—
Chalk, precipitated			
Suprex white	ton	32.50	@45.00
Clay, Aerfloted, Suprex	ton	10.00	@22.50
Aerfloted Paragon	ton	10.00	@22.50
Crown (f.o.b. plant)	ton	11.00	@ —
Dixie	ton	—	@10.00
Kaolloid	ton	—	@ 9.00
Langford	ton	—	@ 8.50
McNamee	ton	—	@10.00
Par	ton	—	@10.00
Witco	ton	10.00	@ —
Cotton Flock (Dark)	lb.	.10½	@ .13
Kalite No. 1	ton	—	@26.00
Kalite No. 3	ton	—	@36.00
Kalvan	ton	—	@100.00
Kalvan "S"	lb.	—	@ .09½
Keystone white	ton	—	@14.00
Magnesium carbonate	lb.	.06¼	@ —
Mineralite	ton	—	@30.00
Pyrax A	ton	—	@ 7.50
Rottenstone (powd. Dom.)	ton	25.50	@37.50
Rubberol	lb.	—	@ .17½
Silene (calcium silicate)	lb.	.04	@ .045
Snowflake white	ton	—	@16.00
Starch, powdered	cwt.	2.90	@ 4.10
Talc, domestic	ton	17.00	@25.00
Whiting, commercial	ton	16.00	@26.00
Columbia Filler	ton	9.00	@14.00
Witco	ton	6.00	@ —
Wood Flour (100 mesh)	ton	30.00	@32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	@ —
Black Diamond	ton	25.00	@ —
Hard Hydrocarbon	ton	25.00	@27.00
MilliMar	lb.	—	@ .05½

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00	@ 4.50
Rodo #10	lb.	5.00	@ 5.50
Curodex 19	lb.	2.75	@ —
Curodex 188	lb.	3.50	@ —
Curodex 198	lb.	4.50	@ —
Para-Dors	lb.	4.50	@ —
Aresklene No. 375	lb.	.35	@ .50
Darvan (dispersing agent)	lb.	.30	@ .34
Santomerse S	lb.	.11	@ .25
Sponge Paste	lb.	—	@ .18
Sunproof	lb.	.22¾	@ .27¾
Tackol (tackifier)	lb.	.085	@ .18
Tonox	lb.	.50	@ .59
Ty-Ply	gal.	6.75	@ 8.00
Unicel (blowing agent)	lb.	.50	@ —

SOFTENERS

Acids			
Acetic, 28%, bbls.[a]	100 lb.	3.38	@ 3.63
Nitric, 36 degrees	cwt.	5.00	@ —
Acids, Fatty			
Laurex	lb.	.14¾	@ .17¼
SL #10	lb.	.12	@ .14
Stearex Beads	lb.	.10	@ .11
Stearite	lb.	.10	@ —

Alkalies			
Caustic Soda, 76%	cwt.	2.70	@ 5.70
Soda Ash, 58%	cwt.	1.15	@ 2.38
Oils			
Cycline Oil	gal.	.14	@ .20
Degras, bbls.	lb.	.10	@ .12
Para-Flux	gal.	.17	@ .18
Para-Lube	lb.	.046	@ .048
Petrolatum, amber [b]	lb.	.03⅜	@ —
Pigmentaroil ,tank cars	gal.	.20½	@ —
in drums	gal.	.26½	@ .27½
Pine, tanks	gal.	.55	@ —
Rosin Oil, cmpd.	gal.	.40	@ —
Rubberol	lb.	.13½	@ .14
Rubtack	lb.	.10	@ —
Seedine, c.l.	lb.	.07¼	@ —
Tackol	lb.	.08½	@ .18
Witco Palm Oil	lb.	—	@ —
Witco Softener No. 20	gal.	.20	@ —
Woburn No. 8, c.l.	lb.	.06	@ —
Resins and Pitches			
Pitch, Burgundy	lb.	.06	@ —
coal tar	ton	19.00	@22.00
hardwood	ton	16.00	@22.50
pine, 200 lb. gr. wt.	bbl.	—	@ 4.50
Pigmentar, tank cars	gal.	.20½	@ —
in drums	gal.	.26½	@ .27½
Retort Pine Tar, drums	gal.	.26¼	@ .27¼
Solvents			
Acetone, pure [a]	lb.	.07	@ —
Benzene, 90%, tank car	gal.	.14	@ —
Beta-Trichlorethane	gal.	—	@ .20
Bondogen	lb.	.98	@ 1.05
Carbon, bisulfide	lb.	.05	@ .08½
Carbon tetrachloride	gal.	.83	@ 1.27
Dichlorethylene	lb.	—	@ —
Dipentene, cml., drums	gal.	.48	@ .50
Ethylene dichloride	lb.	.07½	@ .08½
Plastogen	lb.	.07¾	@ .08
Reogen (drums)	lb.	.11½	@ .12
Rub-Sol	gal.	.09½	@ —
Trichlorethylene	lb.	.08	@ .09½
Turpentine, spirits	lb.	.78½	@ —
dest. dist., drums	gal.	.50	@ .55
Waxes			
Beeswax, white [b]	lb.	.58	@ —
Carnauba, yellow [b]	lb.	.83¼	@ —
Ceresin, white, dom.	lb.	.13½	@ .15
Montan, crude	lb.	—	@ —
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼	@ —
Refined, 123/125	lb.	.05¼	@ —

ANTI-OXIDANTS

Agerite Alba	lb.	1.95	@ 2.05
Gel	lb.	.52	@ .54
Hipar	lb.	.61	@ .63
Powder	lb.	.43	@ .45
Resin	lb.	.43	@ .45
Resin D	lb.	.43	@ .45
White	lb.	1.23	@ 1.33
Albasan	lb.	.69	@ .74
Antox	lb.	.54	@ .56
B-L-E	lb.	.43	@ .52
Flectol H	lb.	.52	@ .65
Flectol White	lb.	.90	@ 1.15
Neozone A, B, C, D, E	lb.	.43	@ .63
Oxynone	lb.	.77	@ .90
Retardex	lb.	.45	@ .48
Santoflex B	lb.	.52	@ .65
Santovar A	lb.	1.15	@ 1.40
S.C.R.	lb.	.33	@ .35
Stabilite	lb.	.52	@ .54
Stabilite Alba	lb.	.70	@ .75
VGB	lb.	.43	@ .52

EXTENDERS

Naftolen	lb.	.15	@ .25
Vanzak	gal.	.05	@ .06

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35	@ .50
Cocoa Soapstock	lb.	.06	@ .08
Colite	gal.	.90	@ 1.15
Dipex	lb.	.06	@ .08
Glycerized Liquid Lubricant	gal.	—	@ 1.35
Lubrex	lb.	.25	@ .30
Mineralite	ton	—	@30.00
Mold Paste	lb.	.12	@ .18
Sericite	ton	65.00	@75.00
Soap Tree Bark, cut, sifted	lb.	.06	@ .08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25	@ —
Amberex Type B	lb.	.18¾	@ —
Black	lb.	.08½	@ .13
White	lb.	.09	@ .15
Brown	lb.	.10	@ .14
Neophax A	lb.	.16½	@ —

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08	@ .12
Sulfur Chloride, yellow (drs.)	lb.	.03	@ .08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55	@ —
Commercial (bags)	cwt.	2.20	@ —
Telloy	lb.	1.75	@ —
Vandex	lb.	1.75	@ —

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Chemicals and Compounding Materials —

ACCELERATOR Z 51
- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
- Low Dosages for Optimum Cures

Advance Solvents & Chem. Corp.
245 Fifth Ave. New York, N. Y.

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; DPG; Pip Pip; A-10; A-32; A-46; A-100; R-2 Crystals • ANTIOXIDANTS—Flectbl H, White; Santoflex B, BX; Santovar A.

MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York, N. Y.

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 40 years.*

The Aluminum Flake Co.
Akron, Ohio

ALUMINUM HYDRATES
"Alorco" Hydrated Aluminas reinforcing pigments give many desirable properties to rubber. Send for sample.

ALUMINUM CO. OF AMERICA
1970 Gulf Bldg. Pittsburgh, Pa.

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.

Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CALCENE— The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
PITTSBURGH PLATE GLASS CO., COLUMBIA CHEMICAL DIV.
Grant Bldg., Pittsburgh, Pa.

CARBON BLACK-MICRONEX
The world's standard gas black; universally known as the "King of Rubber Pigments."

BINNEY & SMITH CO.
41 East 42nd St. New York City

CARBON BLACK
A Grade for Every Requirement
CONTINENTAL "AAA"—Low heat generating, extremely easy processing. "AA"—Low heat generating, easy processing. "A"—Medium cure, medium processing. "D"—Standard Channel Black.

Continental Carbon Company
295 Madison Ave., New York, N. Y.

CARBON BLACK—Aerfloted
WYEX — TX — HX
Compressed — Compact (Dustless)

J. M. Huber, Inc.
460 West 34th St. New York

CARBON BLACK
"Atlantic" Carbon Blacks meet the exacting standards of modern rubber production.

Chas. Eneu Johnson & Co., Mfrs.
Distributed by
C. P. HALL CO.
Akron — Boston — Los Angeles — Chicago

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

CARBON BLACK
WITCO DISPERSO
and DUSTLESS and a
Complete Line of High Quality
Rubber Chemicals
Wishnick-Tumpeer, Inc.
295 Madison Ave., New York, N.Y.

Do you believe in Your Products?
Then you should believe in telling the rubber industry about them. The MARKET PLACE is the logical place to display your wares.

CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.

Moore & Munger
33 Rector Street New York City

CHEMICALS
Carbon Black—Clay—Colors
Accelerators—Sulphur
Stocks Carried At All Times
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

CHEMICALS

For Rubber	For Industry Generally	
Accelerators	*Acids*	*Latex*
Antioxidants	*Oil of Myrbane*	*Lotol*
Specialties	*Aniline Oil*	*Dispersions*

NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 SIXTH AVE. NEW YORK

CHEMICALS
For Natural & Synthetic Rubber
"PICCO" Brand—Plasticizers; Coumarone Resins; Reclaiming Oils, Coal Tar Naphthas.
Pennsylvania Industrial Chem. Corp.
Clairton Penna.

CHEMICALS
A complete line of plasticizers, resins, substitutes, fillers, etc., for Synthetic, Natural and Reclaimed Rubber.
STANDARD CHEMICAL COMPANY
Akron Savings & Loan Bldg, Akron

CHEMICALS AND MINERAL
Ingredients—Whiting, Clay, Tale, Barytes, Colors. Heavy Calcined Magnesia. Carbonate of Magnesia, Pumice Stone.
Standard Since 1890
Whittaker, Clark & Daniels, Inc.
260 West Broadway New York

COAL TAR CHEMICALS
Coumarone Resins — Tack Producers
Resinous Oils — Dispersing Oils
Reclaiming Oils — Softeners
Solvents
The Neville Company
Neville Island, Pittsburgh, Penna.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Chemicals and Compounding Materials (continued)

COLLOIDAL SULPHUR
COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS

HEVEATEX CORPORATION
78 Goodyear Ave. Malrose, Mass.
Offices in New York, Akron, Chicago

FURNEX—FURNEX BEADS
The High Resilience
Semi-Reinforcing Black

BINNEY & SMITH CO.
41 East 42nd St. New York City

PARA-DORS—
overcome odors in rubber—effectively and at low cost.

GIVAUDAN-DELAWANNA, INC.
Industrial Aromatics Division
330 West 42nd St., New York, N. Y.

COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures

MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

GASTEX
Special Process Reinforcing BLACK. Superior aging and oil resistant properties. Low permanent set.
Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
General Atlas Carbon Div.,
General Properties Co., Inc., Pampa, Texas

PARA-FLUX
The Universal Softener—Adaptable, Uniform. Improves Quality—Economical.

The C. P. Hall Co.
2510 First Central Tower
Akron Ohio

COMPOUNDING Materials

Vulcanizing Agents
Accelerators
Antioxidants
Plasticizers
Dispersions
Pigments
Clays
Mineral Rubber
Aromatics
Blacks

R. T. VANDERBILT CO.
230 Park Ave. New York City

IRON OXIDES
Asbestine—Barytes—Talc—
Soapstone

C. K. Williams & Co.
EASTON, PA.

PELLETEX (The pellet *Gastex*)
The special process reinforcing black in free-flowing form. Saves power; none wasted; protects adjacent colored stocks.
Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
General Atlas Carbon Div.,
General Properties Co., Inc., Pampa, Texas

CUMAR —Paracoumarone Resin.
A neutral gum for rubber compounding.
Samples and prices on request.
The Barrett Div.
Allied Chemical & Dye Corp.
40 Rector St. New York City

LAMP BLACKS
Produced according to the rigid specifications of the makers of EAGLE and OLD STANDARD Germantown Brands.
THE L. MARTIN COMPANY, Inc.
Unit of Columbian Carbon Co.
BINNEY & SMITH CO.
Distributor of Rubber Blacks
41 East 42nd Street New York, N. Y.

RUBBER PROCESSING OILS
For outstanding compatibility in processing natural or modern synthetic rubbers, use
SUN RUBBER PROCESSING OILS
Write
SUN OIL COMPANY
Philadelphia Pennsylvania

DU PONT Rubber Chemicals
DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS
E. I. du Pont de Nemours & Co., Inc.
RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

MAGNESIUM OXIDE
Calcined Magnesium Oxide prepared for use in the compounding of neoprene. Full details on request.
J. T. Baker Chemical Co.
Phillipsburg New Jersey

RUBBER SUBSTITUTES
White, brown and black.
The Carter Bell Mfg. Co.
Springfield, New Jersey

EXTENDER
NAFTOLEN R 100 — Extender for Crude Rubber, Reclaim, Synthetics.
Wilmington Chemical Corporation
10 E. 40th St., New York, N. Y.

MAPICO COLORS
Pure Oxides of Iron
Yellows—Reds—Browns—Black
MAGNETIC PIGMENT CO.
Manufacturers
BINNEY & SMITH CO.
Distributors
41 East 42nd Street, New York, N. Y.

SOFTENERS
Rosin Oil — Pine Tar
Burgundy Pitch
"Galex" — a non-oxidizing Resin
National Rosin Oil & Size Co.
RKO Bldg. New York, N. Y.

"FACTICE"—Prevents blooming, makes colors fast and a smoother batch.
(Reg. U. S. Pat. Off.)
Stamford Rubber Supply Co.
Stamford, Conn.

MOLD LUBRICANT
"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.
PROCTER & GAMBLE
Cincinnati Ohio

SOLVENTS
"Skellysolve"—A superior solvent in six different types for various uses—for making rubber cements—for many different rubber fabricating operations.
SKELLY OIL CO., SOLVENTS DIV.
Skelly Bldg., Kansas City, Mo.

The Market Place

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Chemicals and Compounding Materials (continued)

STEARIC ACID
STEAREX . . . CAKE or POWDER
STEAREX BEADS
Standardized Products for Rubber Compounding
MINERAL RUBBER (Parmr), TALC
SOAPSTONE
BINNEY & SMITH CO.
41 East 42nd St. New York City

WAXES
Johnson's lustrous wax finishes retard oxidation, reduce friction, surface wear, tackiness.
S. C. JOHNSON & SON, INC.
Racine Wisc.

ZINC OXIDE PIGMENTS
The XX Reds Kadox
ZINC SULPHIDE PIGMENTS
The Cryptones The Albaliths (Lithopones)
The New Jersey Zinc Sales Co.
New York *Chicago*
Cleveland, Boston, San Francisco

SULPHURS
Rubbermakers' TIRE BRAND and TUBE BRAND. Also CRYSTEX Insoluble Sulphur, Sulphur Chloride, Caustic Soda, Carbon Bi-Sulphide, Carbon Tetra-Chloride.
Stauffer Chemical Company
2710 Graybar Bldg., New York City

ZINC OXIDES
AZO ZZZ Zinc Oxides
lead free—pure—uniform—dependable
AZO ZZZ-11 AZO ZZZ-55
AZO ZZZ-22 AZO ZZZ-44 AZO ZZZ-66
American Zinc Sales Company
Columbus, Ohio *New York*
Chicago *St. Louis*

ZINC OXIDES
Black Label Red Label Green Label
Manufactured by Our New Electrothermic Process
St. Joseph Lead Co.
250 Park Ave., New York
Plant and Laboratory: Monaca (Josephtown), Pa.

TITANIUM PIGMENTS
TITANOX
Unsurpassed in
OPACITY, WHITENESS, BRIGHTNESS
Titanium Pigment Corp., Sole Sales Agent, 111 Broadway, New York, N.Y.
104 South Michigan Ave., Chicago
350 Townsend Street, San Francisco
2472 Enterprise Street, Los Angeles

The Progressive Concern Selling to Rubber Manufacturers Uses THE MARKET PLACE for Results

ZINC STEARATE
ZINC LAURATE
Colite Mold Lubricant for Extra High Gloss
THE BEACON COMPANY
87 Bickford St., Boston, Mass.

Machinery and Equipment

BANBURYS REPAIRED
Re-building and re-surfacing rotors and mixing chambers has been our specialty for years.
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914 Miami St. Akron, Ohio

CUTTING MACHINERY
Specialists in Rubber Cutting Equipment for Bands, Crude Stock, Jar Rings, Tubes, Rollers, Washers, Treads, Cement Stock, etc.
See Black Rock for All Cutting Problems
Black Rock Manufacturing Co.
179 Osborne St. Bridgeport, Conn.

FORMS - PORCELAIN
Exclusive Manufacturers of Vitreous Porcelain Closed End Forms
No matter what shape or design—we can make it. Send blue print or sketch for our prices.
The Colonial Insulator Co.
936 Grant St. Akron, Ohio

CALENDER SHELLS
Gammeter's
ALL STEEL Calender Shells.
All welded. Any size.
New and better.
The W. F. GAMMETER CO.
Cadiz Ohio

DIAL GAUGES—Thickness
For measuring the thickness of rubber and similar materials. Many models.
Frank E. Randall
248 Ash St.,
Waltham Mass.

GRINDING MILLS
SPAN grinding mill reduces soft and hard rubber to fine powder.
Made in U. S. A.
M. Pancorbo
155 John St. New York, N. Y.

CUTTING DIES
Cutting and perforating dies of all types for rubber manufacturers.
Send for our quotations
Brockton Cutting Die & Machine Co.
Avon, Mass.

DRYING MACHINERY
For Synthetic Rubber, Reclaimed Rubber, Latex Processed Materials, etc.
PROCTOR & SCHWARTZ, INC.
Seventh St. & Tabor Rd. Philadelphia, Pa.

MACHINERY—RUBBER
"Master" Tube Molds, Tire Vulcanizers, Molds and Cores, Tire Drums, Tubers, etc.
Special Machinery Built to Order
Akron Standard Mold Co.
Akron, Ohio

CUTTING DIES
Also Tools, Dies, Jigs, Fixtures. Machine Parts and Special Machinery. Now engaged in Prime and Subcontract Work, Defense and Civilian.
Independent Die & Supply Co.,
LaSalle & Ohio Sts. St. Louis, Mo.

EXTRUDERS
The pioneer line of tubers, strainers and wire insulating machines. For latest developments inquire of
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Paterson New Jersey

MACHINERY
L. ALBERT & SON
Trenton, N. J. Stoughton, Mass.
Los Angeles, Calif. Akron, O.

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Machinery and Equipment {continued}

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A complete service from the design of machinery to finished products of all kinds. Equipment for Plantations — also Reclaim, Latex and Rubber Plants.
Layouts — Formulas — Processes
Continental Machinery Company
305 BROADWAY, NEW YORK, N. Y.

MOLDS
For tires, rubber specialties and mechanical goods; general machine work.
The Akron Equipment Co.
Akron, Ohio

STOCK SHELLS
A Type for Every Need—Large Diameter—Light Weight — Extra Strong — Seamless.
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

MACHINERY
Cutting, Trimming, Skiving, Cementing, Eyeletting, Cutting Dies—Eyelets.
United Shoe Machinery Corp.
140 Federal St., Boston, Mass.

Processing Equipment
For Reclaiming Rubber
Attrition Mills; Conveyors; Crushers; Cutters; Elevators; "Frigidisc" Grinders; Hammer Mills; Mixers, Sifters, etc.
ROBINSON MFG. CO.
30 Church St., New York, N. Y.

TESTING MACHINES
RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
Write for Descriptive Literature
Henry L. Scott Co.
P. O. Box 963 Providence, R. I.

MAGNETIC EQUIPMENT of All Kinds
Separators, Clutches, Rolls, Drums, Brakes, Special Magnets
Stearns Magnetic Mfg. Co.
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RUBBER STRIP CUTTER
Strips slab rubber up to 1" thick, 20,000 feet in 8 hours. Any width. Tolerance 1/64 to 1/100 inch. No rejects. Write for full details.
Simplex Cloth Cutting Mach. Co.
270 W. 39th St., New York, N. Y.

USED MACHINERY
For Rubber & Allied Industries
Mills, Calenders, Hydraulic Presses, Tubers, Vulcanizers, Mixers, etc.
Eric Bonwitt
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MANDRELS—All Types
Circular and Straight—Aluminum and Steel
Licensed Under Clyde E. Lowe Co. Patents
Sherardizing and Chrome Plating
Machinery—Air Bag & Mandrel Polishing
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

SPECIAL MACHINERY
For Quality and Efficiency in Working Rubber. Consult us about your problems.
Utility Manufacturing Co.
Cudahy, Wisconsin

WEATHERING UNIT
The National X-1-A Accelerated Weathering Unit quietly evaluates substitute materials, new formulas, established products.
NATIONAL CARBON CO., INC.
Carbon Sales Div.
Cleveland, Ohio

Rubber—Crude; Scrap; Latex; Dispersions

CRUDE RUBBER
BALATA—SYNTHETIC CHICLE
We handle Manufacturers' Crude Rubber and Balata Purchase Permits.
Charles F. Connor & Co., Inc.
110 State St. Boston, Mass.
Telephone: LAFayette 1202

DISPERSITE
Water Dispersed Rubber
(Reclaimed—Crude—Synthetics)
Man-made Alternate for Latex
Dispersions Process, Inc.
1230 Sixth Ave., New York, N. Y.
Offices in Detroit, Boston, Indianapolis

LOTOL
(Compounded Latex)
Ready to use
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
Rockefeller Center, New York, N. Y.
Offices in Detroit, Boston, Indianapolis

CRUDE RUBBER
SCRAP RUBBER
Also HARD RUBBER DUST
H. Muehlstein & Co., Inc.,
122 E. 42nd St., New York City
BRANCHES: Akron, Chicago, Boston Detroit, Los Angeles, London, Paris

GUAYULE RUBBER
AMPAR BRAND
Washed and Dried
Continental-Mexican Rubber Co.
Incorporated
745 Fifth Avenue, New York City
Formerly Distributed By
Continental Rubber Co., of N. Y.

REVERTEX
Highly Concentrated (About 75%)
Rubber Latex
Sole Distributor for U. S. A. and Canada
Revertex Corp. of America
37-08 Northern Blv'd., L. I. City, N. Y.

CRUDE RUBBER
SCRAP RUBBER
HARD RUBBER DUST
BALATA — GUTTA PERCHA
Hermann Weber & Company
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LATEX
Normal, Concentrated, Processed
HEVEATEX CORPORATION
78 Goodyear Ave., Melrose, Mass.
Offices in New York, Akron, Chicago

RUBBER
Crude Rubber
Liquid Latex
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

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Rubber [Cont'd]

RUBBER and PLASTICS SCRAP

ROTEX RUBBER CO., INC.
437 Riverside Ave., Newark, N. J.

RUBBER—Scrap and Crude
Also HARD RUBBER DUST
A. SCHULMAN, INC.
790 E. Tallmadge Ave., Akron, Ohio
14th & Converse Sts., E. St. Louis, Ill.
738 Statler Bldg., Boston, Mass.
500 Fifth Ave., New York, N. Y.
Warehouses at Akron, E. St. Louis and Boston

VULTEX— THE ONLY VULCANIZED LATEX
Insures Highest Quality, Uniformity, Economy, Simplicity of Application.
FULLY PROTECTED BY PATENTS
Also Latex and Latex Compounds
General Latex & Chemical Corp.
Successors to the Vultex Chemical Company
666 Main St. Cambridge, Mass.

Reclaimed Rubber . . . .

NERVASTRAL RECLAIMING PROCESSES
HIGH GRADE — HIGH SPEED
HIGH ECONOMY
Rubber & Plastics Compounds Co., Inc.
30 Rockefeller Plaza, New York, N. Y.
Tel: COlumbus 5-0085

RECLAIMED RUBBER—
For All Purposes
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 Sixth Ave., N. Y. City

RECLAIMED RUBBER—
Uniformity, reliability, cleanliness
PEQUANOC RUBBER CO.
Butler, N. J.

RECLAIMED RUBBER—
A standardized grade for every requirement.
U. S. Rubber Reclaiming Co., Inc.
500 Fifth Ave., New York, N. Y.
"60 Years Serving the Industry Solely as Reclaimers"

Rubber—Synthetic

HYCAR
For extreme resistance to heat, abrasion, oil, gasoline, aging, and deterioration.
HYCAR CHEMICAL COMPANY
335 South Main St.
Akron Ohio

NEOPRENE
In different types to meet stringent requirements.
The Neoprene Notebook carries up-to-date information on neoprene. Ask for it.
E. I. du Pont de Nemours & Co., Inc.
Rubber Chemicals Div.
Wilmington Del.

PERBUNAN
Oil Resistance—Heat Resistance
Long Life
Full information upon request.
STANCO DISTRIBUTORS, INC.
26 Broadway New York, N. Y.

THIOKOL
Synthetic rubber available in several types, including powder form. Excellent heat and solvent resistance.
THIOKOL CORPORATION
Trenton N. J.

Consultants

CHEMISTS-ENGINEERS
Our staff of chemists, engineers and bacteriologists, with laboratories for analysis, research, physical testing and bacteriology are prepared to render you
Every Form of Chemical Service
FOSTER D. SNELL, INC.
305 Washington Street, Brooklyn 1, N. Y.

CONSULTING
LATEX TECHNOLOGIST
R. J. Noble, Ph.D.
21 Woodland Road, Malden, Mass.

CONSULTING
Rubber Technologist
Natural and Synthetic Rubber
R. R. Olin Laboratories
P. O. BOX 372. AKRON. OHIO
Telephones: HE 3724, FR 8551

Fabrics—Liners, Hollands

CUSTOM FINISHERS of
RUBBER REPELLENT LINERS
Capitol Process Liner Treatment
Textile Proofers, Inc.
181-183 Culver Avenue
Jersey City, N. J.

PROCESSED LINERS
"CLIMCO"—Fabrics treated to prevent adhesion of rubber stocks.
"LINERETTE"—Treated paper for separating or interleaving light weight rubber stocks.
The Cleveland Liner & Mfg. Co.
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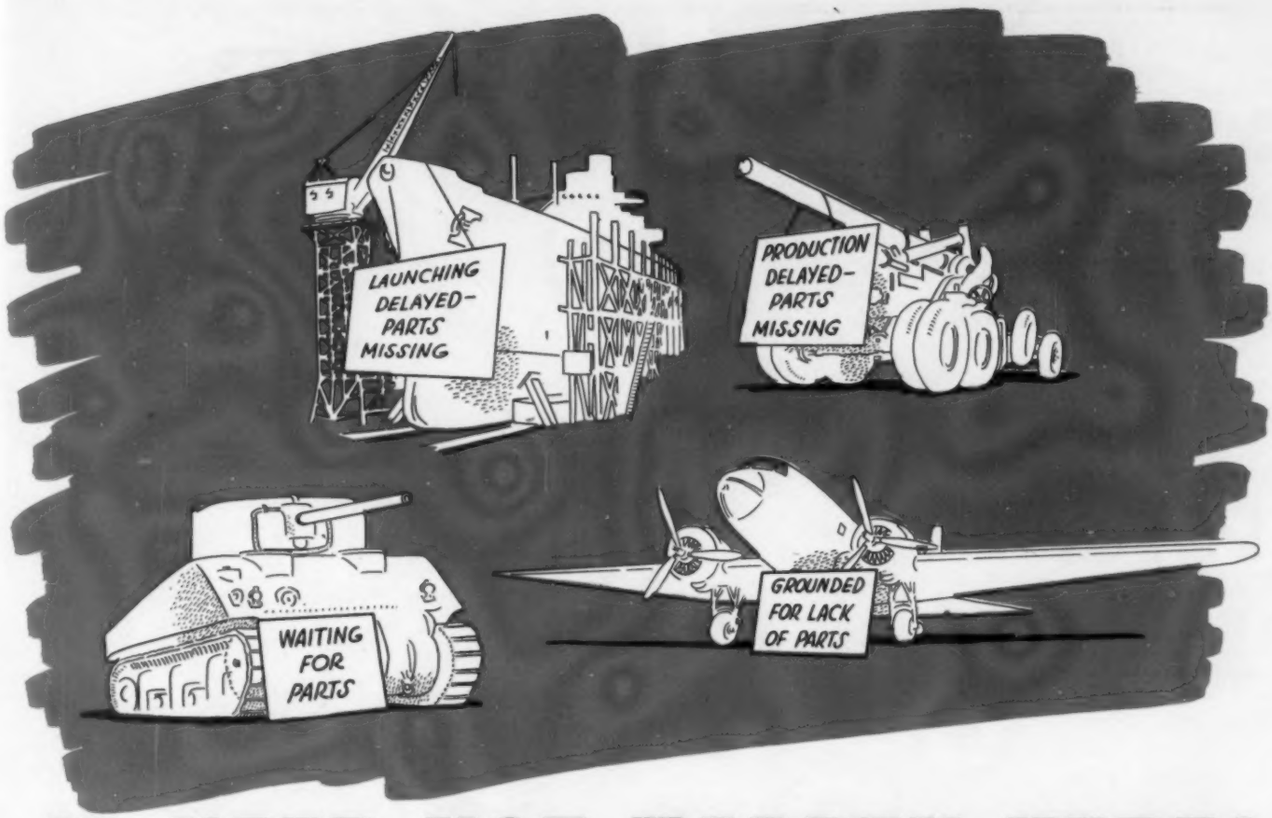

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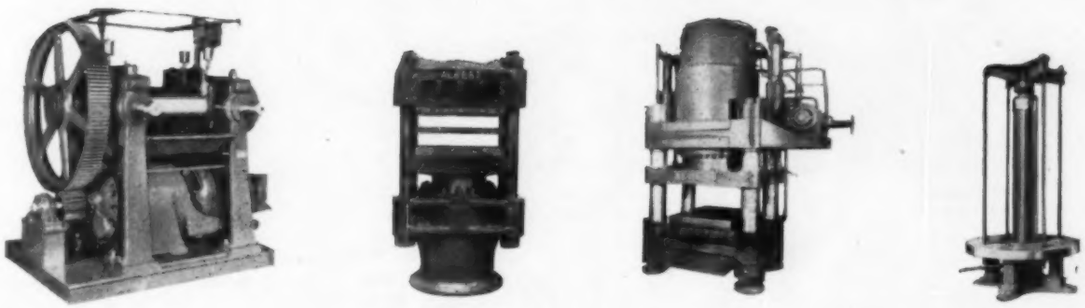

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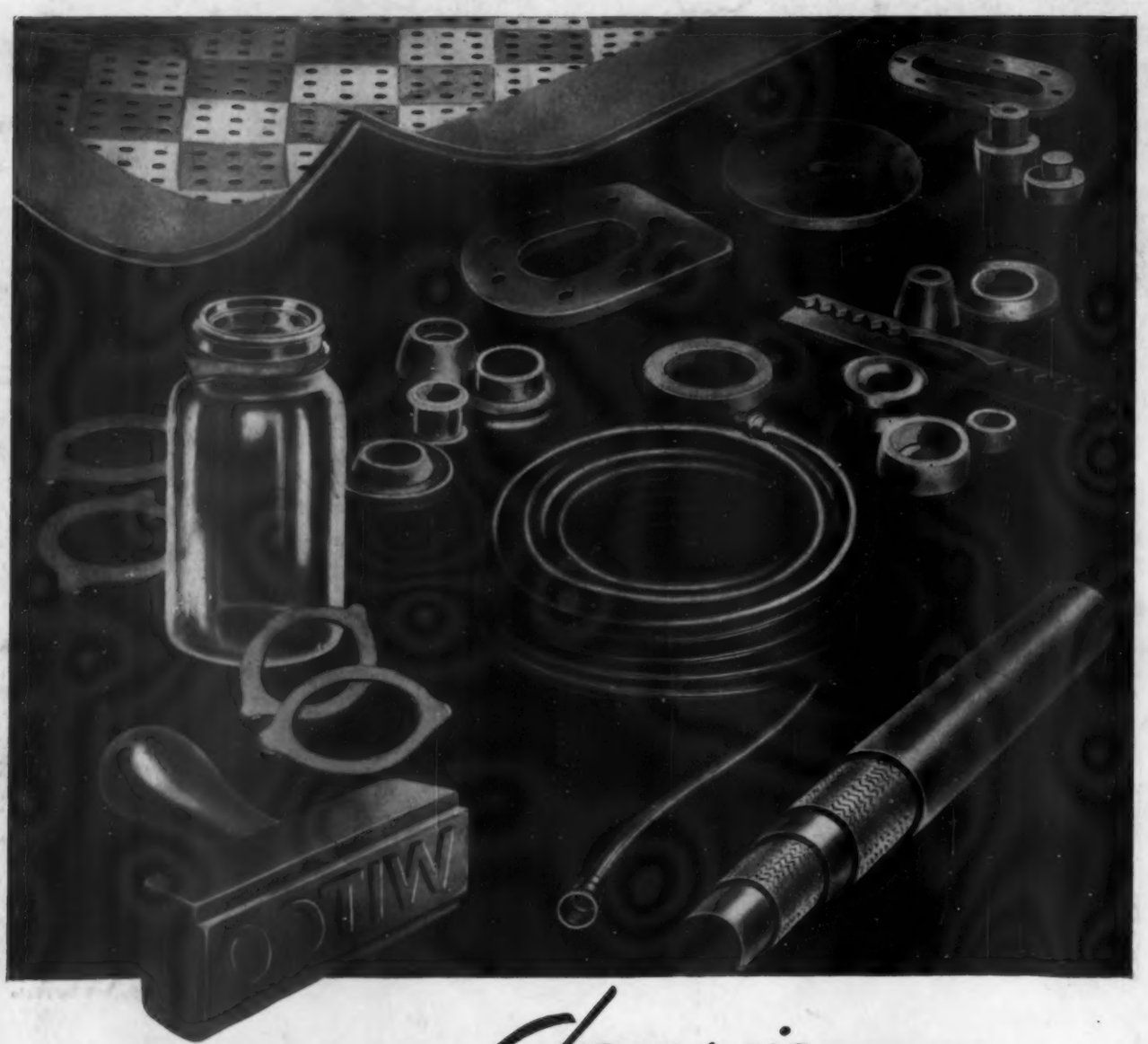

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